

abduction, 6	Canadian Supreme Court's criteria for, 11
abduction theory, 6	consensus standard for, 5
accountability	court problems with standards of, 113
cognitive biases increased by, 23	Daubert standards of, 95
cognitive dissonance effect increased by, 23	determining, 6, 54
dilution effect and, 33	error rate importance to, 112
feedback's importance for, 16	expert testimony and, 19
for decision outcomes, 35	Frye v. United States and, 4
for inferences, 33–34	lawyers/judges determinations of, 63
hypothesis testing and, 44	of character evidence, 212
individual decision making and, 16	of mtDNA, 113
judgment improved by, 23, 34	statistical significance and, 68
of judges, 16, 33	sufficiency conflation of, 82–84
of jurors, 33	adversarial system, 130, 132
Actual Innocence Project, 124	AFIS. See Automated Fingerprint Identification
actuarial instruments	System
admissibility and, 140-142	aggression, absence of, 209
and human judgment, 140	aggression, lack of, 209, 216–217
brain dysfunction diagnosis by, 197	Aitken, C. G. G., 115
components missing from, 166	Aldridge, Peter, 98
explanatory power of, 140	American Academy of Forensic Sciences survey,
future dangerousness predictions and, 162	102
IQ tests, 164	American Psychiatric Association, 128
least-squares stepwise multiple regression	analogy-based reasoning, 8
analysis, 164	anchoring heuristic, 151, 152
multi-disciplinary teams v., 126	animal studies
multiple regression statistical tool, 163–164	advantages of, 73
Receiver Operating Characteristic curve	arguments against, 72
statistics of, 126	chemical exposure in, 71, 73
relative accuracy of, 144	court's rejection of, 72
risk analysis advantage of, 141	judges difficulties with, 71
sexual violence analysis via, 161	limitations of, 71
testimony based on, 166	misconceptions regarding usefulness of, 76
theory underlying, 140	rodent studies, 71
admissibility	rodent study, 71
actuarial instruments and, 140-142	rule-of-thumb hierarchical ranking of, 70
assessing expert's conclusions for, 53-56	superiority of, 70
battered women syndrome testimony, 219	toxicology's use of, 186
Burn's question on, 33	arguments. See scientific arguments



Aristotelian syllogism, 6	cycle inconsistency in, 222
Ashbaugh, David R., 107	expert testimony permitted for, 218
assessment(s)	formal v. substantive equality and, 225
EPA risk, 69	learned helplessness as false perception in,
of arguments, 59	220, 222
of conclusions, 53–56	psychological impact evidence for, 229–231
of risk, 48	questioning Walker's methodology regarding,
of scientific validity, 51	223
probabilistic, 65	reasonable assessment for, 226
Supreme Court and general, 9	scientific unsoundness of, 225
violence risk, 166	size differential considerations in, 215
assumptions	social context evidence for, 225
criteria for basic, 51	testimony admissibility for, 219
intellectual due process and, 51	Walker, Lenore, on, 220–221, 222–223, 225
mtDNA's usefulness, 117–118	battered woman/women
randomness, 177	characterization of,
reliance on, 50	PTSD of, 230–231
theories built on, 51	Walker's definition of, 221
understanding statistical, 62	batterers, lenient sentencing for, 229
Australia	battling, of experts, 19, 50
Alyce Chamberlin murder case of, 97	Bayes theorem, 24
convictions overturned in, 97–98	Becker, Gary, 169
expert testimony admissibility in, 13	behavior, future
no reliability requirements of, 12	impossibility of predicting, 138
probative value emphasis in, 13	predicting weather v. predicting, 139
pseudo-science problems of, 99	behavioral decision research
U.S. style legislation of, 13	between-subjects designs, 182, 183
Automated Fingerprint Identification System	college students as subjects for, 177-181
(AFIS), 106	double-blind experiment control lack in, 185
availability heuristic, 151, 194, 198	experimental design in, 176–181
	experimental design trade-offs, 183
Barefoot v. Estelle (Supreme Court decision),	failing of, 189
124	practical significance lack in, 188
and regime of evidentiary federalism,	small effect sizes of, 188
127–129	subject (people) variation influence on, 181
Blackmun's dissenting opinion in, 129	within-subjects design, 182, 183
dilution effect and, 153	behavioral decision theorists
evidentiary contradictions of, 127–131	claims of, 176
future dangerousness testimony and, 128	heuristic choice of, 173
group decision making dynamics and, 149	human beings observations of, 170
psychiatric testimony in, 128	natural selection considerations of, 172
rules of evidence changed since, 128	questions asked by, 175
base rate	behavioral decision theory. See also decision
defined,	making; decision theorists
fallacy, 195	biological interactive systems and, 171
neglect, 197	law and economics v., 169–176
battered woman syndrome, 207. See also	methodology debate, 176
feminists; Walker, Lenore.	strength/weakness of, 170
as power struggle,	between-subjects designs, 182, 183
as sub-species of PTSD, 224–225	bias(es)
assessing scientific validity of, 220–221	cognitive illusions as,
bogus science exclusion from, 231	defining, 28, 149 instinct and, 175
castle doctrine and, 215	mstinct and, 1/5



minimizing decision making, 22 of groups, 28 overconfidence, 27, 34, 152, 199 physical attractiveness bias, 24 self-serving, 199	causation attribution of, 58 conundrum, 65 court's difficulty with, 57 Daubert and, 83
biological information	
examination of, 47	general, 58
	human studies and, 70
inferential synergy of combined, 48	Koch's postulates of, 58–59 making decisions about, 62
biological significance, 64	
biological/statistical significance importance	proving, 82
biological/statistical significance importance to, 64	scientific uncertainty about, 58
	specific, 58
human-animal similarities of, 73	Chamberlain, Alyce, 97
bitemark identification, 94, 96, 109–110	Chemical Institute of Toxicology report, 86 chemicals
Kunco v. Commonwealth case and, 110	
People v. Marx court case and, 109	animal studies and, 71, 73
State v. Krone case and, 110	EPA's regulation of, 49
Black, Bert, 99	illness caused by, 47
Blackmun, Harry A., 124	safety testing lack for, 80
Barefoot dissenting opinion by, 129	choice shift, group polarization and, 29, 31
Daubert v. Merrell Dow Pharmaceuticals, Inc.	Christensen-Szalanski, J., 189
majority opinion of, 129	civil law, lower standards of, 65
bounded rationality, 20–22, 169	clinical double-bind studies, 68
unrealistic views of mind replaced by, 20	clinical predictions, 125
Bourke, Judy, 99	inaccuracies of, 125, 129
brain, human	CODIS. See Combined DNA Index System
actuarial instruments, measurement of, 126	cognitive bias(es)
as computer (metaphor), 44	accountability's influence on, 23
nonlinearity of, 139	dilution effect as, 23–26
Brown, Malcolm, 101	cognitive dissonance, 27
Bukszar, E., 188	accountability and, 23
burden of proof, 67	decision making and, 201
Burns, Robert, 33	defined, 150
	juries and, 150
Canada	overconfidence and, 150
Daubert approved by courts of, 11	cognitive dissonance theory
Supreme Court of, 11	resilience of,
cancer	cognitive illusions. See also social psychology
causation issues, 77	cognitive quirks
EPA default position on, 77	capital sentencing impacted by, 148–150
rodent study extrapolations on, 71	cognitive shortcuts, 148
Capital Juror Project, 133, 138	coherence theory (of rationality), 19
capital sentencing, 123	cohort studies, 68
cognitive quirks impact on, 148–150	Cole, Simon A., 107
criminal sentencing v., 132	Combined DNA Index System (CODIS),
expert testimony proffered at, 133, 146	104
gatekeeping and, 131–133	common law countries, 11–14
heightened reliability standards of, 131	judges as gatekeepers in, 18
jury decision making for, 146, 149	community notification statutes, 155
overconfidence heuristic and, 150	complex decisions, 20
systematic biases of concern in, 150-153	complexity theory, 138-140, 173, 202
case-control studies, 68	concern for accuracy (in common law), 19, 21
castle doctrine, 215	27, 33, 107



conclusions, scientific	criminal sentencing, capital sentencing v., 132
conflicting, 38, 55	Cummins, Harold, 100
languaging problem of, 55	cumulative studies, impact of, 57, 71, 233-234
tentative phrases couching of, 55	
confidence interval	Damaska, Mirjan, 130
defined, 60	data
scientist's use of, 66	actuarial instruments for analyzing, 126
confidence limits, 61	conflicting, 49
conflict, creating impression of, 67	examining available, 47-49
Connolly, T., 188	trimming, 63
Constitution (U.S.)	data dredging experiments, 38
Eighth Amendment, 135	Daubert v. Merrell Dow Pharmaceuticals, Inc.
Fourteenth Amendment, 135	decision, 4
controls, importance of, 52	admissibility standards of, 95
convictions	and causation, 83
foundationless evidence and, 95	as constitutional minimum, 124, 133–137
overturning of, 97	Blackmun's majority opinion in, 129
correspondence theory (of rationality), 19	Canada's approval of, 11
court(s)	circumventing mandate of, 111
admissibility standards, problems of, 113	evidentiary contradictions of, 127–131
analysis standards, circumvented by, 95	expert testimony admissibility prior to,
animal studies rejected by, 72	expert testimony influenced by, 129
causality difficulties of, 57	fingerprint challenge of, 105
causation conundrum in, 65	Frye's difference with, 10
certainty sought by, 54	judicial analysis influenced by, 11
criminal evidence dilemma of, 96	junk science and,
domestic violence issues of, 203	Kozinski's remand in, 10
epidemiological studies and, 69	Rehnquist's dissent of, 7, 9–10
evidence excluded by, 65, 67, 84, 93	relevance and,
expert testimony rejected by, 74, 131	standards, 82
extrapolation struggles of, 76	structured analysis required under, 149
future dangerousness testimony exclusion by,	Supreme Court (U.S.) guidelines for, 5
130	Supreme Court's granting of certiorari in, 9
general acceptance test of,	unanswered questions of, 84
in vitro tissue culture studies, discomfort of,	Dawes, Robyn, 171
80	death penalty
lab standards/protocols issues of, 53	future dangerousness and, 143
pseudo-science admitted into, 99	jurisprudence, 134
risk assessment/management by, 48	Supreme Court's minimal standard for, 136
scientific validity examined by, 11	decision making. See also behavioral decision
scientific validity not addressed by, 127	theory; social psychology
State v. Council failure by, 120–121	accountability in, 35
courtroom disputes, scientific evidence focus in,	aids to, 22
Cowans, Stephen, DNA evidence exoneration	Barefoot v. Estelle and dynamics of group, 149
of, 108	basis of sound, 208
Coyle, Marcia, 99, 102	biological/evolutionary process consideration
Crane, Michael, 164. See also Kansas v. Crane	in, 171
Criminal Cases Review Commission (England),	by judges, 14, 18, 46
12	by juries, 14
criminal cases, judge testimony permissiveness	causation and, 62
in, 94	cognitive dissonance theory and, 201
criminal laboratories, modernizing protocols	disbelief in rational choice models of, 21
of, 10	experimental settings v. real world, 186



group v. individual, 28	dose-response relationships, 53, 73
heuristics and, 20–21	dual-process model of reasoning, 189–190
increasing accuracy of, 34	Due Process Clause (14th Amendment)
individual biases in, 28, 149	right to fair hearings of, 134, 135
inferences and, 21–22	due process, free-standing, 135
minimizing biases in, 22	
nonperfection in,	economists, probability theory and, 171
of groups, 27–32, 33, 149, 152	effect size, 188–189, 191
question variance for, 192	egocentric biases, 26
simplification of, 59	Eighth Amendment (U.S. Constitution), 135
story model model of, 147–148	emotions
structural analysis advantages in, 126	framing effects and, 193
decision theory, 170	nonrandomness of, 193
defendant, lack of aggression by, 209, 216–217	empirical support
defense of premises doctrine, 203	criminal evidence lacking in, 53
democratic system, rule of law in, 122	expert's need for, 54
descriptive statistics, 60	England
Diagnostic and Statistical Manual (DSM-IV),	Criminal Cases Review Commission of, 12
133	no reliability requirements of, 12
Diamond, Jared, 175, 196	Royal Commission on Criminal Justice of,
dilution effect, 23–26, 33	12
as cognitive bias, 149	Sally Clark case of, 12
accountability and, 33	English law, admissibility of expert opinion
Barefoot v. Estelle and, 153	testimony under, 11
causes of, 24	Environmental Protection Agency (EPA)
group processes lowering of, 26	cancer default position of, 77
heuristics underlying, 24	chemicals regulated by, 49
irrelevant information and, 149	guidelines of, 5
DNA	risk assessment, 69
nuclear analysis of, 116	scientific claims evaluated by,
PCR technique and, 104	target-organ studies position of, 77
RFLP analysis of, 112	EPA. See Environmental Protection Agency
STR of, 104	epidemiological studies, 58, 64, 69
VNTR of, 104	courts and, 69
DNA Identification Act, 102	limited availability of, 73
DNA typing. See also mitochondrial	meta-analysis technique, 180
deoxyribonucleic acid; nuclear DNA	small sample size problems in, 177
analysis; restriction fragment length	epidemiologists, operational criteria of, 58
polymorphism DNA analysis	epistemology
as boon for defense/prosecution, 100–102	gatekeeper issue view of, 14
as DNA "fingerprinting," 104	naturalized,
as gold standard, 104	normative, 122
Kron exoneration from, 110	reciprocal containment, 7
National Research Council reports on, 118	social, 14
theory behind, 115	Epstein, Robert, 108
Virginia State Crime Lab errors with, 101	equality
doctrine of relevance, 18	competing conceptions of, 206–209
domestic violence	criticism of, 206–207
cycles/phases of, 220	formal equality issue, 208, 225
expert testimony about, 225	gender and, 206
judge's/court's issues with, 203	justice and, 204
misconceptions about prevalence of, 205	substantive, 204, 206–207, 208, 225
statistics on, 203	equilibrium theory (of evolution), 173
· · · · · · · · · · · · · · · · · · ·	±



error rates	jury education by, 166
admissibility and, 112	Netherland's appointment of, 57
identification techniques for, 96	nontolerance for confusion created by, 145
errors	overconfidence bias and, 34
commission of statistical, 103	perjury by, 97
random v. systematic, 60	wrongness/rightness of, 96
Europe, inquisitorial adjudication system of,	extrapolation(s)
131	animal to human, 72-73
Everett, Ian, 108	court struggles with, 76
evidence, criminal	high dosage to low dosage, 73-77
court's dilemma regarding, 96	qualitative, 73
empirical support lacking in, 53	quantitative, 73
failing to report contradictory, 63	rebuttable presumption similarity to, 72
scientifically unsound, 95	rodent study, 71
types of excluded, 123	route of exposure, 78–80
evidence, hearsay, 123	target organ, 77–78
evidence law, 204	
evidence, rules of, 205	F.B.I.
abandoning strict adherence to, 124	CODIS of, 104
accuracy concerns, 19	fingerprint misidentification by, 109
Barefoot v. Estelle's influence on, 128	Justice Department report on, 97, 102–103
declining to apply, 132	STR loci (sites) used by, 104
gender-blind, neutrality of, 206	substandard forensic lab work by, 102
modernizing protocols of, 10	whitepaper hair analysis commentary of,
evidence, scientific	115
cumulative impact of, 80–82	facts, scientific
exclusion of, 65, 67, 84, 93	knowledge and, 50
Frye v. United States and,	probabilistic nature of, 66
litigation and, 8	false positive
proffered probability statement for, 103	false negative v., 102–103
evidence, self-defense, 209–210	tests, 103
evidence, social context, 223	falsification
evidence-based medicine movement, 197	of assertions, 161
evidentiary federalism, 127–129	of incrimination, 112
exemplary reasoning, 6	of null hypothesis, 170
experiments	theory of, 7, 42, 44
data dredging, 38	Faulds, Henry, 106
designing of, 52–53	FDA. See Food and Drug Administration
on humans, 58	Federal Death Penalty Act of 1994, 133
experts, scientific	Federal Judicial Center, 59
admissibility inquiry of, 19	Federal Rules of Evidence (U.S.), 131
assessing conclusions of, 53–56	1975 adoption of, 9
battling of, 19, 50	amendment to, 4
categorical v. statistical articulation of results,	Australia's legislation similarity to, 13
142	
concerns regarding, 19	judges and, 4–5 feedback
conflicting conclusions of, 38, 55	
	accountability's importance for, 16 feminists
court-appointed/adversarial, 11	
cross-examination of, 12	equal treatment under law issue, 204
diagnosis/prediction variance of, 126	formal equality issue, 208, 225
empirical support needed by, 54	non-equal applications of rules, 206
excess leeway provided to, 99	relational, 207, 209
information gap influence on, 49	science critiqued by, 37



Index 245

self-defense rules critique of, 206 juries influenced by, 142-143 substantive equality issue, 204, 206-207, 225 lack of scientific basis for, 136 fingerprints/fingerprint technology, 94 nonexamination of, 146 concerns for accuracy, 107 scientific validity lacking in, 156 Daubert's challenge to, 105 discrepancies with, 112 Galton, Francis, 106 Faulds cautions regarding, 106 gambler's fallacy, 174 Galton's statistical model for, 106 game theory, 21 Judge Pollack's effort regarding, 112 gaps, in scientific knowledge, 51 lack of controlled studies regarding, 105 gatekeepers appropriateness of role of, 10 Llera Plaza I court case and, 107 matching process difficulties with, 107 epistemology view of, 14 National Institute of Justice and, 107 judges as, 7, 11, 18, 35, 153, 232 People v. Jennings court case and, 105 need for, 14 problems with, 106 Supreme Court (U.S.) divided on issue of, reliability concerns about, 104-109 14 zero error claims made regarding, 108 gatekeeping Food and Drug Administration (FDA), 68 and capital sentencing, 131-133 forensic laboratories judicial, 153 FBI substandard work in, 102 Gaudette, B. D., 115 gender, equality and, 206 mandatory regulation lacking in, 102 methodological problems in, 101 general causation, 58 scientific standards ignored in, 96-97 general consensus standard. See Frye test General Electric Co. v. Joiner, 4, 55, 81 forensic odontologists (bitemark experts), 97 forensic science, 95, 98 Daubert standards reiterated in, 129 formaldehyde, example of toxic tort analysis, 84 standards, 82 Fourteenth Amendment (U.S. Constitution), unanswered questions of, 84 135 generalization framing effects heuristic, 190-193, 194 inductive, 6 Frank, Jerome, 92 probabilistic, 6 genocide, 196 frequentist statistics, 21 Frye v. United States Giannelli, Paul C., 120 Daubert's difference with, 10 Gibbons, Ann, 116, 117 Frye test, 4, 13 Gigerenzer, Gerd, 171 New Zealand equivalence of, 13 global rationality, 20 scientific evidence admissibility standard of,8 Gregg v. Georgia, accurate sentencing fundamental fairness, 232 information and, 135 as requirement of rationality, 136 Grieve, David L., 108 judicial gatekeeping as minimum for, 235 group dynamics, 152 rule of law requirement of, 130 group polarization, 29 future dangerousness predictions choice shift and, 29, 31 actuarial instruments used for, 162 diverse groups and absence of, 31 prior criminal records reliance of, 162 group discussion influence on, 30 under Hendricks/Crane, 156-158 individual changing view explanation of, 30 future dangerousness testimony persuasive argument theory explanation of, American Psychiatric Association's 31 opposition to, 128 studies of, 31 as key to jury's life/death determination, groups castigation of, 129 biases of, 28 court exclusion of, 130 decisionmaking dynamics of, 27-32, 33, 152 death penalty and, 143 extreme judgments by, 29 forms of expert testimony about, 125-127 final judgments of, 28 in United Kingdom (U.K.), 155-156 overconfidence bias and, 34



groups (cont.)	self-serving bias of, 199
polarizations' absence with diversity of, 31	short-cuts used by, 170
social loafing in, 32	stereotyping by, 196
guidelines	human studies
of Environmental Protection Agency, 5	as "gold standard," 68
of Supreme Court, 5	causation and, 70
1	inherent weaknesses of, 69
hair analysis, 94, 96	rule-of-thumb hierarchical ranking of, 68
F.B.I.'s whitepaper commentary on, 115	hung juries, 149
mtDNA testing used in, 114	hypotheses
State v. Council use of, 115, 117	careful construction of, 93
theory of, 114	determining validity of, 47
Williams v. Reynolds case and, 111	testing of, 61
handwriting analysis, 94, 96	theories v., 46–47
Hansen, Mark, 99	hypothesis testing. See also testability
Hare Psychology Checklist-Revised (PCL-R),	accountability in, 44
133	effect of variables in, 44
Hart, D. L., 104	in scientific method, 36
Hastie, Reid, 138, 147, 171	
hearsay evidence, 123	identification techniques. See also bitemark
Hendricks, Leo, 163. See also Kansas v.	identification; fingerprints/fingerprint
Hendricks 157	technology; hair analysis; voice
heuristic(s)	spectrography
anchoring, 151, 152	challenging previously accepted, 10
availability, 151, 194, 198	DNA as, 47
behavioral decision theorists choice of, 173	error rates for, 96
bias and, 175	problems of, 100
capital sentencing and overconfidence, 150	types of, 94
cognitive psychologist's meaning of, 20–21	in vitro tissue culture studies, 80
decision making and, 20	individual decision making
defined, 20	accountability and, 16
dilution effect and, 24	group decision making v., 27, 32
framing effects, 190–194	individual variation
instinct and, 175	analysis of variance, 181
overconfidence, 150	consequence debates regarding, 182
representative, 24–25, 151, 194, 198	problems of, 181–184, 186
satisficing, 20	statistical methods for dealing with, 181
social norms, 24, 25–26	individuals, unique identifying characteristics
stereotyping outsiders, 196	of, 47
support theory for, 190	inductive generalization, 6
high-dosage extrapolations, 73–77	inductive reasoning, 6
Higuchi, Russell, 117	infant deaths, unexplained, 101. See also sudden
Hill, Austin, 58	infant death syndrome 98 inference(s)
Holt, Sarah B., 105	
homicide common law doctrine of justified, 217	abduction and, 3
self-defense as justification for, 208	accountability for, 33–34 causal, 64
hot hand fallacy, 174	, ,
	components of scientific, 48
human beings decision theorist observation of, 170	decision making and, 21–22
	justifiable, 7 making inappropriate, 63
experimenting on, 58 imperfect studies of, 185	statistical, 41, 63
natural selection and, 172	unavoidability of, 51
manara ociection and, 1/2	



inferential statistics, 60	science difficulty of, 5
inferential synergy, 48	science thinking success of, 10
information	scientific testimony evaluated by, 4
biological, 47	scientific validity questioned by, 9
cognitive shortcuts in processing, 21	scientist's viewpoint v. viewpoint of, 66
difficulty sorting, 23	screening irrelevant information by, 18
gaps in, 49	self-defense involvement of, 209
heuristics and, 20	study types preferred by, 70
irrelevant v. relevant, 24, 149	Supreme Court (U.S.) guidelines for, 5
judges screening irrelevant, 18	testimony decisions of, 58, 96
juries need for relevant, 146	unconscious decisions of, 15
non-exclusion of, 82	judgment(s)
post-decision dissonance decreased via,	accountability's improvement of, 23, 34
25–27	actuarial instruments and human, 140
rationality and accuracy of, 19	group final, 28
reasoning based on trustworthy, 122	nonperfection of,
relevance of, 33	self-belief in, 27
Innocence Project, 100, 101	shortcuts in making, 21
instinct, heuristics/biases and, 175	structured reasoning's impact on, 16, 22–23
intellectual due process	judicial analysis, Daubert's influence on, 11
assumptions and, 51	judicial screening, 33–35
by judges, 5, 6	of expert witnesses, 18, 27
limitation of, 135	junk science, Daubert's influence on,
relevance as requirement of, 35	juries. See also mock-juries
interdisciplinarity, 8	capital sentencing by, 146, 149
internal validity, 185	cognitive dissonance and, 150
interviews, with death penalty jurors, 147, 151	decision making by, 14
involuntary commitment statutes, 157	duty to retreat imposition by, 217–218
IQ tests, 164	future dangerousness influence on, 142-143
	hung, 149
Janis, Irving, 152	information sorting difficulties of, 23
Joiner. See General Electric Co. v. Joiner	physical attractiveness influence on, 24
judges	predictability and, 142
accountability of, 16, 33	reasoned moral response of, 132
admissibility determinations by, 6, 54, 63	relevant information required by, 146
animal studies influence on, 71	scientific expert's education of, 142, 166
argument assessment by, 59	screening irrelevant information from, 18
as gatekeepers, 7, 11, 18, 35, 95, 153, 232	self-defense constraints of, 214
as triers of science, 4	social environment influence on, 27
Australia's probative value emphasis of, 13	studies of mock-juries, 31
conflict's influence on, 67	unconscious decisions of, 15
criminal case testimony permissiveness of, 94	jurisprudence
decision making by, 14, 18, 34, 46	death penalty, 134
domestic violence issues of, 203	transformation of, 129
educational needs of, 42	jurors
evidence excluded by, 65, 67	accountability of, 33
examining statistical inference by, 63	cognitive dissonance of, 150
expert's testimony consideration by, 46	experts rated by, 147
Federal Rules of Evidence and, 4-5	interviews with death penalty, 147, 151
intellectual due process provided by, 5, 6	overconfidence of, 150
media's influence of, 151	relevance of information to, 33
political pressure on federal, 18	self-belief of capital, 150
role of, 9	skewed perceptions shared by, 151



jurors (cont.)	Lempert, Richard, 104
underestimating years served, 15	Lewontin, Richard C., 104
violence overestimation by, 143	linear effects theory, 75
jury instructions, importance of, 147	litigation
jury system, separation of powers doctrine and,	appropriate inferences in context of, 51
	dosage issues/lab condition issues and, 76
justice	questionable science and, 8
as equal treatment under law, 204	Llera Plaza court case, 98, 107
equality and, 204	Judge Pollack's fingerprint analysis in, 112,
Justice Department Report, 97, 102–103	113
justifiable inferences, 7	loafing. See social loafing
Justin, Peter, 200	logic. See scientific logic
Walan Datable 117	low dosage extrapolations, 73–77
Kahn, Patricia, 117	M Al' 100
Kahnemann, Daniel, 190	Maceo, Alice, 100
Kansas Sexually Violent Predator Act ("Kansas	Marshal, Eliot, 117, 120
Act"), 162. See also pedophilia 156	Marusic, Ana, 117
Kansas v. Crane, 156–158	materiality, principle of, 122
Kansas v. Hendricks, 156, 157, 158	Mayfield, Brandon, 109
Kaye, David H., 116, 118	McCartney, Carole, 97
Kershaw, Sara, 109	medical research, control-based ranking used
killing, men v. women, 229	in, 185
knowledge	Megans's Law, 155
gaps in scientific, 51 scientific dialogue and growth of, 45	men, killing of women v. killing of, 229
scientific facts and, 50	meta-analysis technique, 180
	metaphors brain as computer, 44
Koch, causation postulates of, 58–59 Koehler, Jonathan J., 98, 100, 115, 120, 190	heart as pump, 44
Koenig, Bruce E., 96	scientific theories and, 46
	scientific understanding aided by, 39, 51
Kozinski, Judge admissibility factor added by, 10	methodology
Daubert remand of, 10	defined, 51
Kreuger, Joachim, 174	protocols and standardization of, 52
Kuhn, Thomas, 38	questioning soundness of, 56, 116
Kumbo Tire v. Carmichael, 5	Midlo, Charles, 100
Daubert standards reiterated in, 129	Minnesota Multiphase Personality Inventory
Kunco v. Commonwealth case, 110	(MMPI), 197
Ranco v. Commonwealth tust, 110	Minnesota Sex Offender Screening Test-Revised
Lakatos, Imre, 38	(MnSOST-R), 159
law	mitochondrial deoxyribonucleic acid (mtDNA)
evidence, 204	analysis, 113, 114
guaranteed equal protection under, 206	assumptions regarding usefulness of, 117–118
human behavior research influence on,	PCR technique used with, 118
168–169	possible DNA contamination with, 118
justice as equality under, 204	MMPI. See Minnesota Multiphase Personality
moral authority of, 232	Inventory (MMPI)
social psychology's importance to, 168	MnSOST-R. See Minnesota Sex Offender
lawyers	Screening Test-Revised (MnSOST-R)
admissibility determinations of, 63	mock-juries, studies of, 31
examining statistical inference by, 63	Mohan court decision, 11
least-squares stepwise multiple regression	mtDNA. See mitochondrial deoxyribonucleic
analysis, 164	acid (mtDNA)
legal paradigms, social construction of, 38	multiple regression statistical tool, 163-164



Index 249

murder, rule of law and, 155 physical attractiveness, influence of, 24 Murdock, John E., 102 policymakers, reliable information needed by, myth, science v., 45 Pollack, Judge, 112, 113 National Institute of Justice, 107 polygraph technique, National Research Council, DNA reports by, polymerase chain reaction (PCR) technique, 104, 118 natural selection, 172 Popper, Karl, 36, 39, 43 naturalized epistemology, 7 population genetics theory, 100 nature never repeats assertion, 100 post-traumatic stress disorder (PTSD) battered woman and, 224-225, 230-231 Netherlands, court appointed experts in, 57 Neufield, Peter, 100 description of, 230 New Zealand Powell, Lewis, 124 expert testimony admissibility in, 13 power Frye test equivalent of, 13 defined, 42, 60 no reliability requirements of, 12 significance levels and, 63 nonscientists, reasoning process of, 6 toxic court cases and, 66 normative epistemology, 122 truth and, 17 nuclear DNA analysis, 116 predator. See sexual predators null hypothesis, 44, 61, 62, 63 predictability defined, 61 and juries, 142 falsification of, 170 inherent limits of, 140 importance of, 187 rare events and, 141 predictions objectivity, scientific method and, 37 clinical/actuarial, 125, 129 complexity theory and inherent limits of, Occupational Safety and Health Administration 138-140, 202 formaldehyde exposure standards of, 86 inaccuracy of violent behavior, 198 outcomes, self-enhancing interpretations of, rightness v. wrongness of, 148 199 prejudices (prior), tainting influence of, 126 overconfidence preponderance standard, 82-84 cognitive dissonance and, 150 probabilistic assessment, 65 of jurors, 150 probabilistic generalization, 6 overconfidence bias, 27, 34, 152, 199 probabilistic reasoning, 8, 39-43 overconfidence heuristic, 150 probability, 62 as physical quality, 40 Paracelsus's maxim, 74 definition of, 40 paradigms. See legal paradigms; scientific scientists and, 41 statistical inference and, 41 paradigms pattern recognition, 197 theory of, 40 PCR technique. See polymerase chain reaction probability theory, 40, 114, 171 technique proficiency testing, 102 pedophilia, Kansas Sexually Violent Predator proof, burden of, 67 Act and, 157 proportionality, self-defense and, 214 Peirce, Charles Sanders, abduction theory of, 6 prospect theory, 190, 191, 192 penile plethysmographs, 162 psychiatrists, Barefoot v. Estelle testimony by, Pennington, Nancy, 138, 147 psychologists, cognitive, heuristics and, 20-21 People v. Jennings court case, 105 People v. Marx bitemark case, 109 PTSD. See post-traumatic stress disorder persuasive arguments theory, 29, 31, 148-150 Peterson, Joseph L., 102 qualitative extrapolations, 73 phallometric studies, 161 quantitative extrapolations, 73 penile plethysmographs used in, 162 Quinie, Willard V.,



racial stereotyping, 197	due process and, 35
random sampling, 25, 178	screening for, 14
randomness assumptions, 177	reliability, scientific, 4, 46
randomness, statistical inference and, 41	representative heuristic
Rapid Risk Assessment for Sexual Offense	defined, 195
Recidivism (RRASOR), 159	original study of, 24-25, 151, 194
rare events, predictability of, 141	research on, 198
rational choice, 24	research, laboratory v. field, 193-195. See also
rational utility theory, 171	medical research; scientific research
rationality, 5	restriction fragment length polymorphism
accurate information prerequisite to, 19	(RFLP) DNA analysis, 112
as goal of rule of law, 19	retrials, bad lab practices leading to, 97
asserting goals of, 6, 17	RFLP DNA analysis. See restriction fragment
bounded, 20, 22, 169	length polymorphism DNA analysis
constraints of, 38	rights, fundamental, 135
correspondence/coherence theory of, 19	Risinger, D. Michael, 96
debatable meaning of, 36	risk. See also violence risk assessments
fundamental fairness requirement of, 136	actuarial instrument improvement of, 141
game theory assumption of,	analysis, 141, 144, 159
global, 20	as probabilistic statement, 159
real world, 19	as social construct, 141
reasoning. See also structured reasoning	assessment v. management of, 48
"dual-process model" of, 189–190	of violent recidivism, 156, 163
about biological systems, 64	relative, 60
analogy-based, 8	Roberts, Paul, 94
deductive, 45	rodent studies, 71
exemplary, 6	route of exposure, 78–80
inductive, 6	Royal Commission on Criminal Justice, 12
metaphorical basis (proposed) for, 189	RRASOR. See Rapid Risk Assessment for Sexual
probabilistic, 8, 39–43	Offense Recidivism (RRASOR)
structured, 7, 140	rule of law
training's improvement of, 34	as safeguard, 17
trustworthy information based, 122	definition of, 6, 17
underlying principles of, 5	fundamental fairness requirement of, 130
Receiver Operating Characteristic curve	in democratic system, 122
statistics, 126	murders/violent sex offenses and, 155
recidivism, violent, 156, 163	truth/rationality goals of, 19, 122
base rate of, 156	trutil/rationality goals of, 17, 122
prediction of, 164	Saks, Michael J., 98, 100, 114
Reference Manual on Scientific Evidence	Sally Clark case (England), 12, 97, 98
(Federal Judicial Center), 233	satisficing heuristics, 20
regression analysis, 163	Scheck, Barry, 100
VRAG and, 164	science. See also Reference Manual on Scientific
Rehnquist, William	Evidence (Federal Judicial Center)
Daubert dissent of, 7, 9–10	as charter of uncertainty (Frank), 92
Joiner and, 83	as collaborative enterprise, 81
relational feminists, 207, 209	as creative process, 38
relative risk, 60	as process movement, 92
relevance	background assumptions of, 42
conditions of, 35	determining what counts as, 122
criteria of, 130	feminist critique of, 37
Daubert and,	idea construction process of, 47
doctrine of 18	iunk 8



Index 251

Kuhn's philosophy of, 38 questioning methodology of, 56 litigation and questionable, 8 repeating of, 60 metaphor and, 39, 51 structure-activity relationship, 80-81 myth v., 45 target-organ, 77 Poppers' philosophy of, 36, 39, 43 toxicology, 52, 58, 78 probabilistic reasoning underlying, 39 scientific testimony, complexity of, 14-15 questioning/critical attitude of, 38 scientific validity value-laden nature of, 141 assessing, 51 scientific analysis, theories as starting points for, battered woman syndrome and, 220-221 challenging of, 10 court's examination of, 11 scientific arguments cognitive shortcuts in evaluating, 148 future dangerousness testimony and, 156 demystification of judge's questioning of, 9 language/structure of proficiency testing/high lab standards and, theory/data juxtaposition in, 45 scientific dialogue, 45 shared perceptions of, 38 scientific inferences, 48 state's tests for, 4 scientific logic, nonspecialness of, scientists. See also nonscientists scientific method argument assessment by, 59 definitions of, 36 basic premise agreement of, 42 hypothesis testing in, 36 belief/reality disconnect of, 41 objectivity as goal of, 37 confidence interval used by, 66 Popper's debunking of, 36 differences among, 36-37 Supreme Court (U.S.) on, 36, 84 evaluation process of, 39 scientific noses, counting of, 6-11 inaccuracies controlled/eliminated by, 62 scientific paradigms, social construction of, 38 judge viewpoint v. viewpoint of, 66 scientific research non-magic numbers used by, 63 behavioral decision, 176-181 non-threshold response assumed by, 76 experimental settings v. real-world decision Popper on task of, 43 making, 186 probability and, 41 growing sophistication of, 49 theories as understood by, 41 individual variation concern in, 181 valid causal inferences of, 64 on self-perception, 174 screening. See judicial screening scientific studies. See also animal studies; self-categorization theory, 29 human studies self-defense in vitro tissue culture, 80 absent alternatives for, 212 battered women study (Walker, Lenore), 221 as justification for homicide, 208 biological significance studies, 64 deceased's character relevance in, 212 building/integrating influence of, 81 defendant's lack of aggression, 216-217 case reports, 69 defined, 214 case-control, 68 duty to retreat as, 217-219 evidence of, 209-210 clinical double-bind, 68 cohort, 68 excuse v. justified, 203 controlling extrinsic variables in, 52 feminist critique of rules of, 206 "heat of passion," 203 epidemiological, 58, 64, 69 inferential synergy of combining research imminence requirement for, 203, 210-211, from, 48 judge preferences of, 70 judge involvement for, 209 of group polarization, 31 jury constraints with, 214 of mock-juries, 31 personal size considerations for, 214-216 on self-perception, 174 proof requirements for, 209 phallometric studies, 161, 162 proportionality requirement for, 214 post-decision dissonance study, 25-27 temporal proximity requirement for, 211



self-perception, research on, 174	standard deviation, 60, 63, 176
self-serving bias, 199	standards
Sensbaugh, George, 116	admissibility consensus, 5
sentencing hearings. See also capital sentencing;	civil law's lower, 65
criminal sentencing	Daubert, 82
as evidentiary free-for-alls, 123	forensic laboratories ignoring of, 96-97
court's failure to address scientific validity at,	goal of scientific, 66
127	Joiner, 82
court's refusal to scrutinize expert testimony	legal v. scientific, 65, 66
at, 131	preponderance as, 82–84
declining to apply rules of evidence at, 132	State v. Council
hearsay evidence admitted at, 123	admissibility standards problem in, 5
separation of powers doctrine, 17	court's failures in, 120–121
sex offenders	hair identification used in, 115, 117
hearings for, 158–159	State v. Krone case, bitemark/DNA
incorrigibility of, 155	identification and, 110
MnSOST-R and, 159	statistical analysis, 60
sex offenses. See also Kansas Sexually Violent	statistical assumptions, 62
Predator Act ("Kansas Act"); predator,	statistical inference, 41
sexual	statistical significance, 61
rule of law and, 155	admissibility and, 68
statutes regarding, 156	biological significance and, 64
unpredictability of, 157	importance of, 64
Sexual Offender Risk Assessment Guide	legal burden of proof and, 67
(SORAG), 159	power and, 63
sexual predators	unthinking use of, 67
community notification statutes and, 155	statistical techniques, 181
defined, 156	statistical theory, 160
phallometric studies of, 161	statistics
sexual violence	errors in, 62
instruments used in assessing, 159	frequentist, 21
phallometric studies and, 161	social psychologists use of, 176–178
short term repeats (STR), 104	statutes
short-cuts, uncertainty and use of, 170	community notification, 155
shortcuts, cognitive, 148	involuntary commitment, 157
SIDS. See sudden infant death syndrome	sexually violent predator, 156
significance	stereotyping
statistical, 61	as human thought characteristic, 196
testing, 67	racial, 197
social comparison theory, 29	tainting influence of, 126
social epistemology, 14	stereotyping outsiders heuristic, 196
social influence network theory, 29	Stoney, David A., 106
social loafing, in groups, 32	story model model, of decision making,
social norms heuristic, 24, 25–26	147–148
social psychology	STR. See short term repeats
debates regarding, 23	structure-activity relationship studies, 80–81
legal importance of, 168	structured reasoning, 7, 45, 140
statistics used in, 176–178	judgment improved by, 16, 22–23
SORAG. See Sexual Offender Risk Assessment	students,(college) as research subjects, 177–18
Guide (SORAG)	studies. See scientific studies
specific causation, 58	substantive equality, 204, 206-207, 208, 225
St. Petersburg Paradox, 190	sudden infant death syndrome (SIDS), 12
Stacey, Robert B., 107, 109	suffering, women's v. men's, 207



sufficiency, admissibility conflated with, 82-84	explanatory power of, 45-47
support theory, 175, 190, 194	falsification theory, 42
shortcoming of, 202	game theory,
Supreme Court (Canada), admissibility criteria	hair identification theory, 114
of, 11	hypothesis v., 46–47
Supreme Court (U.S.)	linear effects theory, 75
and future dangerousness testimony, 127	metaphor applied to, 46
certiorari granted in <i>Daubert</i> by, 9	methodology for gaining acceptance of,
Daubert guidelines of, 5	189
death penalty minimal standards of, 136	persuasive arguments theory, 29
evidence excluded by, 93	Popper on, 43
expert admissibility jurisprudence	population genetics theory, 100
transformed by, 4	probability theory, 40, 114
gatekeeper quandary of, 14	relative evaluation of, 42
general assessment test dispatched by, 9	science's questioning/criticism of, 38, 41, 46
guidelines for judges by, 5	self-categorization theory, 29
Kansas v. Crane examined by, 158	social comparison theory, 29
Kansas v. Hendricks examined by, 156, 157	social influence network theory, 29
on scientific method, 36, 84	strength of, 45
	testability of, 43
target-organ studies, 77	threshold theory, 74
testability	thinking, by association, 25
as key precept, 43	Thompson, William C., 120
challenges to, 44	three-strikes rules, 162
testimony, expert	threshold theory, 74
actuarial instrument based, 166	tort cases, proving causation in toxic, 57
Australia/New Zealand admissibility of,	toxicology studies, 52, 58, 78
13	animals used in, 186
based on hypothetical question, 128	meta-analysis technique, 180
capital sentencing and, 133, 146	small effects size/large consequences of, 188
court's refusal to scrutinize, 131	small sample size problems in, 177
court's rejection of, 74	trials, criminal. See also retrials
Daubert's influence on, 129	proffered probability statement at, 103
domestic violence, 205, 225	types of evidence excluded from, 123
evidentiary rules and, 205	trimming, of data, 63
future dangerousness, 125–127	truth
inadmissibility of, 83	adversarial system perspective on, 130
juries assisted by, 142	as contest for power, 17
jurors lack of confidence in, 147	as goal of rule of law, 19, 122
nonscrutinization of, 23	asserting goals of, 6, 17
on battering, 218	debatable meaning of
polygraph technique and	evidentiary practice and, 124
pre- <i>Daubert</i> admissibility of	negotiating, 37
relevance/reliability screening of, 14, 144	Tversky, Amos, 190
sex offender hearings and, 158–159	Twining, William, 94, 95
transforming jurisprudence of, 129	
Wright v. Willamette Industries, Inc. and, 84	uncertainty, scientific
theories, scientific	about causation, 58
assumptions and, 51	rational decisions under conditions of, 58
coherence theory, 19	United Kingdom (U.K.)
correspondence theory, 19	convictions overturned in, 97–98
determining validity of, 47	future dangerousness predictions in,
DNA typing theory, 115	155–156



254 Index

United States v. Lowe court case, DNA methodology and, 111 validity. See internal validity; scientific validity variable number of random repeats (VNTR), 104 variance, analysis of, 181 violence. See also domestic violence; sexual violence age influence on, 144 American families and, 228 inaccurate predictions regarding, 198 jurors overestimation of, 143 predicting probability of recurring, 161 three-strikes rules and, 162 Violence Risk Assessment Guide (VRAG), 159 author attributed accuracy of, 165 hypothesis underlying, 163-165 regression analysis and, 164 violent conduct definitions, 163 violence risk assessments biological basis possibility for, 167 uncertainty of, 166 Violent Crime Control and Law Enforcement Act (1994), 155 Virginia State Crime Lab, DNA typing errors by, VNTR. See variable number of random repeats voice spectrography, 94, 96, 98

discrediting of, 99 voiceprints, 96, 98

Walker, C. P., 97 Walker, Lenore, 220-221, 222-223, 225 Wertheim, Kasey, 100 Whitaker, D. D., 96 Whitehurst, Frederic, 97 Williams v. Reynolds case, hair analysis and, Williams, R. L., 108 Wilson, Paul, 101 within-subjects design, 182, 183 witnesses, expert judicial screening of, 18 oath required of, 19 women abusive relationship entrapment of, 228 killing of men v. killing of, 229 science critique by, 37 suffering of, 207 Woods, Frank G., 106 Wright v. Willamette Industries, Inc., 84 assessing expert's conclusions in, 89-92 causation hypothesis, 85 court's causation conundrum in, 92 evidence availability, 86-87 expert testimony and, 84, 89

VRAG. See Violence Risk Assessment Guide

(VARG)

Zuckerman, Adrian, 94

validity of assumptions in, 87-92