BIBLIOGRAPHICAL NOTES

This is the more comprehensive version of the notes and references of the book, THE GAP: The Science of What Separates Us From Other Animals.

Chapter 1: The Last Humans

4 John Herschel: Herschel, 1830.
5 Descended from the apes?: For background on the murky history behind this quotation, see the Quote Investigator (February 9, 2011): http://quoteinvestigator.com/2011/02/09/darwinism-hope-pray.
5 On the Origin of Species: Darwin, 1859.
6 The Descent of Man: Darwin, 1871.
6 the split occurred some six million years ago: The genetic evidence suggests human and chimpanzee lines diverged 6.3 million years ago (Patterson et al., 2006); fossils of potential common ancestors, Sahelanthropus tchadensis (Brunet et al., 2002), Orrorin tugenensis (Senut et al., 2001), and Ardipithecus kadabba (Haile-Selassie, 2001), point to a similar time of divergence.
6 (Footnote 3) 99.4 percent: Wildman et al., 2003. Some estimates suggest the difference between the genomes is better approximated as 4 percent and complex factors such as structural changes ought to be considered (Varki et al., 2008).
8 embodied cognition: e.g., Isanski & West, 2010.
8 judge a hill to be steeper: Proffitt, 2006; but see Durgin et al., 2009.
8 Richard Owen, the founder of: Gross, 1993.
9 Milan Kundera’s astute reply: Kundera, 1992; see also Humphrey, 1992.
9 William James: James, 1890.
9 “In the distant future: Darwin, 1859, p. 335.
9 Even evolutionary psychology: e.g., Barkow et al., 1992; Cosmides & Tooby, 1997.
10 textbooks on evolutionary psychology: e.g., Badcock, 2000; Buss, 1999.
10 pioneers such as Wolfgang Köhler: e.g., Köhler, 1917/1925; Yerkes & Yerres, 1928.

*Homo floresiensis*: Brown et al., 2004; see also subsequent debate: e.g., Brown, 2012; Oxnard et al., 2010.

*Gigantopithecus*: Ciochon, 1996.

(Footnote 6) Traditionally these are: Larick & Ciochon, 1996.

(Footnote 6) *Australopithecus sediba*: Berger et al., 2010.


*Guns, Germs, and Steel*: Diamond, 1997; see also Flannery, 1994.

blankets infested with smallpox: Fenn, 2000; Ranlet, 2000.


goes back to prehistoric hunter-gatherers: Bowles, 2009; Keeley, 1996.

12–13 kill members of their own species: Goodall 1986.

*Neanderthal inheritance*: Green et al., 2010; Green et al., 2006.

Denisovans: Derevianko, 2012; Krause et al., 2010.

**Chapter 2: Remaining Relatives**


it is social problems: Humphrey, 1976; see also Jolly, 1966; Whiten & Byrne, 1988.

It is hardly an exaggeration: Köhler, 1917/1925, p. 293.

Primates are fond of grooming: e.g., Dunbar, 2010.

a vervet monkey mother: Cheney & Seyfarth, 1980.

Achieving high rank: de Waal, 1982; Goodall, 1986.

Dunbar established that the greater: Dunbar, 1992; Dunbar & Shultz, 2007.

Primate foraging: e.g., Boesch, 1994; Byrne & Russon, 1998; Visalberghi, 1987.

Taxonomists subdivide primates: e.g., Groves, 1989; Stanford et al., 2013.

apes grow up slowly: Bogin, 1999; Wich et al., 2004.


Carl Linnaeus: Linnaeus, 1758.

widely used classification: e.g., Stanford et al., 2013.

They comprise four distinct genera: Geissmann, 2002. For more on gibbons, see http://www.gibbons.de.


psychological testing of gibbons: Hill et al., 2011.


Hainan black crested gibbon: Stone, 2011.


"Leakey’s Angels": Fossey, 1983; Galdikas, 1980; Goodall, 1986.

a few other committed undertakings: see Whiten et al., 1999.
climbing relatively slow and considered: Povinelli & Cant, 1995.
stay in the subadult (unflanged) stage: Harrison & Chivers, 2007; Utami et al., 2002.
Carel van Schaik: van Schaik et al., 2003; van Schaik et al., 1996.
Anne Russon and Birute Galdikas: Russon & Galdikas, 1993.
first draft of the gorilla genome: Scally et al., 2012.
first initiated by Dian Fossey: Fossey, 1983.
Recent fecal analyses: Hofreiter et al., 2010.
Dick Byrne: e.g., Byrne & Byrne, 1993; Byrne & Russon, 1998.
a gorilla was observed using a stick: Breuer et al., 2005.
chimpanzees at Rockhampton Zoo: e.g. Collier-Baker et al., 2005.
the social lives of chimpanzees: e.g., Goodall, 1986.
boundaries that male groups patrol: Goodall, 1986.
it was widely believed: e.g., Lorenz, 1963.
seek out medicinal plants: Huffman, 1997.
ways of fishing them out: E.g., Whiten et al., 1999.
stone tools 4,300 years ago: Mercader et al., 2007.
only described in 1929: Schwarz, 1929.
collaboratively hunt monkeys: Surbeck & Hohmann, 2008; Hofreiter et al., 2010.
a lot more sex: de Waal, 1996.
larger brains are more intelligent: McDaniel, 2005.
Do humans, then, simply have the largest brains?: For absolute and relative brain weights of various species, see Jerison, 1973; Roth & Dicke, 2005.
170 billion cells: 86 billion neurons and nonneuronal cells: Azevedo et al., 2009.
Table 2.1: Jerison, 1973; Roth & Dicke, 2005.
(Footnote 12) absolute size is the better predictor: Deaner et al., 2007.
first documented microscopic distinction: Preuss et al., 1999.
density is much higher in humans: Elston et al., 2006.
unravel the mysteries of the brain: e.g., Dehaene, 2012; Del Cul et al., 2009; Greenfield, 2000; Weil & Rees, 2010.

(Footnote 13) information flow has reversed: Noack, 2012.

(Footnote 14) Von Economos neurons: Nimchinsky et al., 1999. For recent evidence for these neurons in elephants, whales, and macaques, see Butti et al., 2009; Evrard et al., 2012; Hakeem et al., 2009.

Chapter 3: Minds Comparing Minds

Daniel Dennett notes: Balter, 2012d.


“the senses and the intuitions: Darwin, 1871, p. 126.

trying to conceal the evidence: Lindsay, 1880.

Lloyd Morgan’s canon: Morgan, 1894.


Edward Thorndike’s: Thorndike, 1911.

(Footnote 2) This case has been argued: Shettleworth, 2010.


(Footnote 3) some killjoy explanations: Collier-Baker et al., 2004; Suddendorf & Corballis, 2008b; Suddendorf et al., 2009a.

(Footnote 3) chimpanzees can notice: Haun & Call, 2008; Nielsen et al., 2005.

William James: James, 1890.

(Footnote 4) evidence that babies assess: Hamlin et al., 2007.

(Footnote 4) challenged by simpler explanations: Scarf et al., 2012.

dreamtime: e.g., Oodgeroo, 1994.

various animals dream: Darwin, 1871.

pretend play in the second year: e.g., Leslie, 1987.

(Footnote 5) Some evidence suggests: e.g., Wilson & McNaughton, 1994.

Kakama carried a log: Wrangham & Peterson, 1996.


The gorilla Koko: Patterson & Linden, 1981.

the chimpanzee Viki: Hayes, 1951.


only one other incident: Matsuzawa, 2008.


Jean Piaget: Piaget 1954; see also Flavell, 1963.

stage 5 object permanence: demonstrated in cats (Dumas & Doré, 1991), chimpanzees (Collier-Baker et al., 2005), dogs (Gagnon & Doré, 1994), dolphins (Jaakkola et al., 2010), gorillas (Natale & Antinucci, 1989), magpies (Pollok et al., 2000), orangutans (Call, 2001b), parrots (Pepperberg et al., 1997), and various species of monkey (Natale & Antinucci, 1989).
49 (Footnote 7): earlier than originally proposed: Baillargeon, 1987.
50 great ape genera have passed: Call, 2001b; Collier-Baker et al., 2005;
50 domestic dogs were one of: e.g., Gagnon & Doré, 1994.
51 dogs had “cheated”: Collier-Baker et al., 2004.
51 passing all of Piaget’s object permanence tasks: Call, 2001b; Col-
51 Josep Call and others: e.g., Call, 2004, 2006; Hill et al., 2011.
51 (Footnote 8) marmosets and gibbons: Mendes & Huber, 2004; Fedor et
   al., 2008.
52 research on mirror self-recognition: e.g., Suddendorf & Butler, 2013.
52 Darwin briefly described: Darwin, 1877
52 Gordon Gallup developed: Gallup, 1970.
52 This experiment has been replicated: For reviews, see Swartz et al.,
52 (Footnote 9) gorillas failed: e.g., Suarez & Gallup, 1981
52 (Footnote 9) gorillas pass: e.g., Posada & Colell, 2007.
53 By twenty-four months close to all: e.g., Amsterdam, 1972; Bard et al.,
53 human and chimpanzee infants: Bard et al., 2006.
53 baboons, capuchins, and macaques all fail: Anderson & Gallup, 2011.
53 conditioned pigeons: Epstein et al., 1981.
53 (Footnote 10) There is some variation: Kaertner et al., 2012
54 dolphins demonstrated mirror self-recognition: Reiss & Marino,
   2001; http://www.pnas.org/content/suppl/2001/05/02/101086398.
   DC1/0863Movie2.mov.
54 Two magpies and one elephant: for magpies, see Prior et al. 2008
   and http://www.youtube.com/watch?v=4mD8velB83w; for the el-
  ephant, see Plotnik et al., 2006 and http://www.pnas.org/content/
   suppl/2006/10/26/0608062103.DC1/08062Movie3.mov.
54 all elephants failed: Povinelli, 1989.
54 we only have strong evidence: Anderson & Gallup, 2011; Suddendorf &
   Butler, 2013.
54 interpretation of this task has been controversial: e.g. Bard et al.,
   2006; Connors et al., 2012; Gallup, 1982, 1998; Heyes, 1994; Lewis et
54 (Footnote 11): failed to make capuchin monkeys “pass”: Roma et al.,
   2007.
54 (Footnote 12) not all passed the task: Swartz et al., 1999; Tomasello &
   Call, 1997.
55 associated with the emergence of self-conscious emotions: Lewis et
   al., 1989.
marked our participants’ legs: Nielsen et al., 2006.
(Footnote 14) Self-recognition in delayed videos: Povinelli et al., 1996; Suddendorf, 1999a.
(Footnote 14) mirrors and photos involves different: Butler et al., 2012.
in mirrors around the same time as: e.g., Chapman, 1987; Lewis & Ramsay, 2004; Nielsen & Dissanayake, 2004.
(Footnote 15): In a review of the research literature: Suddendorf & Whiten, 2001.
parsimony is important: Sober, 1988.

Chapter 4: Talking Apes

Thanks to words: Huxley, 1956, p 83.
the bishop of Polignac: Corbey, 2005.
language is distinctly human: Corballis, 2003; Deacon, 1997; Hauser et al., 2002; Pinker, 1994.
animals also have: Hauser, 1996.
A bee signals the location: Von Frisch, 1967.
alert their group about predators: Hollen & Radford, 2009.
The most fundamental feature: Although it is generally assumed that language is primarily for communication, some scholars have argued that it is primarily an internal instrument of thought: Berwick et al., 2013.
(Footnote 2) This is the case for: e.g., Corballis, 2003.
Symbols are about something: e.g., Perner, 1991.
develop this representational insight: e.g., DeLoache & Burns, 1994.
even twenty-four-month-olds can: Suddendorf, 2003.
known as forming a “meta-representation”: e.g., Perner, 1991; Suddendorf, 1999c.
meaning of a word is related to its sound: Paget, 1930.
(Footnote 5) similar to the game Pictionary: Garrod et al., 2007.
(Footnote 6) less likely to suffer: Diamond, 2010.
Human languages are generative: e.g., Corballis, 2003.
Recursion is considered a key: e.g., Corballis, 2011; Hauser et al., 2002.
this generative grammar: For Chomsky’s recent theorizing and the basic operation he now calls “merge,” see Berwick et al., 2013.
defines the language faculty: Chomsky, 2005; Hauser et al., 2002; for a critique, see Jackendoff & Pinker, 2005; for the debate about recursion, see Coolidge et al., 2011; Corballis, 2011.


(Footnote 10) Skinner had been enticed: Skinner, 1957.

Most children acquire language: There are some individual differences in language acquisition but no established group differences: Berwick et al., 2013.

the tragic case of the girl Genie: Rymer, 1994.

one hundred thousand years ago: Berwick et al., 2013; Chomsky, 2005.

not present in all human languages: Christiansen & Chater, 2008; Corballis, 2009; Evans & Levinson, 2009; Everett, 2005.

Part of the problem may be: Corballis, 2011.

computational models from evolutionary biology: Levinson & Gray, 2012; but see also Berwick et al., 2013.

one study compared word order: Dunn et al., 2011.

Language is the source: de Saint-Exupéry, 1943.


(Footnote 11) I actually like the word: Suddendorf, 2008.

Michael Corballis and I have argued: Suddendorf et al., 2009b; Suddendorf & Corballis, 1997.


Enter Richard Garner: Radick, 2007; Suddendorf et al., 2012.

Hugh Lofting’s Dr. Dolittle: Lofting, 1920.


language first evolved in gestural form: e.g., Corballis, 2003.


These calls are gradually learned: Hauser, 1988.

periaqueductal gray: Gruber-Dujardin & Stefan, 2010.

close examinations of communication systems: Hauser, 1996.

they learn the songs: Garland et al., 2011; Noad et al., 2000.

just enough to say: Smith et al., 2008; Mike Noad, personal communication; see also Handel et al., 2012.

alarm calls of prairie dogs: Slobodchikoff et al., 2009.

a hidden communication system: Mäthger et al., 2009.

(Footnote 12) Great apes have much more voluntary control: Corballis, 2011; Premack, 2007.

I cried out a short and good “Hello!": Kafka, 1917.


Louis Herman: Herman et al., 1993.

Seals have also been trained: Schusterman & Gisiner, 1988.

A border collie, Rico: Kaminski et al., 2004.

Famous examples include: Washoe (Gardner & Gardner, 1969); Koko (Patterson & Linden, 1981); Chantek (Miles, 1994); Sarah (Premack & Premack, 1983); Kanzi (Savage-Rumbaugh et al., 1993).
Chapter 5: Time Travelers

Forethought is the most important: Russell, 1954, p. 179.

Time travel will never become a reality: Holden, 2005.


“It’s a poor sort of memory”: Carroll, 1871.


Distinguish the following memory systems: Squire et al., 1993.


(Footnote 1) In a dramatic documentary: Prisoner of Consciousness, Dollar, 1986.

The ultimate function of this capacity: Suddendorf & Busby, 2005; Tulving, 2005.

Jennifer Thompson thought: Thompson-Cannino et al., 2009.


Remembering episodes is a reconstructive process: Bartlett, 1932.

Recall your own good behavior better: D’Argembeau & Van der Linden, 2008.

Evolution works only on how memory: Suddendorf & Busby, 2005.

Memory systems are inherently future-directed: Bar, 2011; Suddendorf & Corballis, 2007.

Two sides of the same coin?: Schacter et al., 2007; Suddendorf & Corballis, 1997, 2007.

Similar problems imagining future events: Hassabis et al., 2007; Klein et al., 2002; Tulving, 1985.

Children’s capacity to answer such questions: Busby & Suddendorf, 2005; Suddendorf, 2010b. For other similarities in development, see Atance 2008; Suddendorf & Moore, 2011.

Introspectively, there are some: D’Argembeau & Van der Linden, 2004;
In old age we tend to report: Addis et al., 2008.

depressed and schizophrenic patients: Williams et al., 1996; D’Argembeau et al., 2008.

Brain imaging studies have found: Addis et al., 2007; Okuda et al., 2003; Szpunar et al., 2007.

there are some important differences: Suddendorf, 2010a.


imagine situations you have never experienced: Gilbert & Wilson, 2007; Suddendorf & Corballis, 2007.


We differ also in how much we worry: Zimbardo & Boyd, 1999.

John Lennon sang: “Beautiful Boy (Darling Boy).”


shortcomings in any one of the components: Suddendorf & Corballis, 2007.

we share our plans and predictions: Suddendorf et al., 2009b.

We can learn from others’ memory: Social remembering can have negative and positive effects on memory accuracy, though both may be beneficial: Roediger & McDermott, 2011.


How parents talk to their children: Parent-child conversation and children’s memory (e.g., Fivush et al., 2006; McGuigan & Salmon, 2004) and future time concepts (Hudson 2006).


learn to kick a hanging mobile: Rovee-Collier et al., 1980.

the making of a rattle: Barr et al., 1996.

little indication that infants can explicitly recall: e.g., Levine, 2004; Perner & Ruffman, 1995.

insist that they have always known it: Taylor et al., 1994.

In one study we told children stories: Busby Grant & Suddendorf, 2010.

We presented children with a curious puzzle: Suddendorf et al., 2011.

William Friedman: e.g., Friedman, 2005; see also Busby Grant & Suddendorf, 2009.

(Footnote 4) In a follow-up: This study was conducted by my PhD student Jon Redshaw and has not yet been published.

What’s time?: Browning, 1896, p. 425.

no real-life counterparts: Suddendorf et al., 2009a.

The chimpanzee Panzee: Menzel, 2005.

Rats appear to use: e.g., Foster & Wilson, 2006; Tolman, 1948; Johnson & Redish, 2007.


such studies on other animals: For reviews, see Dere et al., 2008; Suddendorf & Corballis, 2008a; Zentall, 2006.

if it walks like a duck: Eichenbaum et al., 2005.


should be able to control their future prudently: Suddendorf & Corballis, 2010.


bacteria demonstrate future-directed capacities: Mitchell et al., 2009.

The wasp always inspects the nest: Fabre, 1915.

taste predicts later sickness: Garcia et al., 1966.

cannot learn that a sound or a sight: Garcia & Koelling, 1966.

gray squirrels learn to bite out: Steele et al., 2001.

select a stick of the appropriate length: Mulcahy et al., 2005.


laboratory monkeys that were fed biscuits: Roberts, 2002.

delay gratification for several minutes: Beran, 2002; Dufour et al., 2007; Rosati et al., 2007.

Perhaps the most prominent case: Mulcahy & Call, 2006a. For critique of this evidence, see Suddendorf, 2006.

(Footnote 6) One high-profile study: Correia et al., 2007; see also Cheke & Clayton, 2012; Raby et al., 2007.

(Footnote 6) In another study, two squirrel monkeys: Naqshbandi & Roberts, 2006. For a killjoy critique, see Suddendorf & Corballis, 2008b, and for the failed replication with rhesus monkeys see Paxton & Hampton, 2009.

subsequent studies: Osvath & Osvath, 2008. For a killjoy critique, see Suddendorf et al., 2009a, and for a romantic rebuttal, see Osvath, 2010.

In another study ten chimpanzees: Dufour & Sterck, 2008.


Chapter 6 Mind Readers

debate about how we do this: e.g., Carruthers & Smith, 1996.
much as we do science: Gopnik, 1993.
simulating their experiences: Gordon, 1996.

(Footnote 1) “intentional stance”: Dennett, 1987.

special affinity for social stimuli: e.g., Moore, 2006; Nelson, 2001.

they prefer to look at open eyes: Batki et al., 2000.

The developmental psychologist Chris Moore: Moore, 2013.

infants start to point: Liszkowski et al., 2004.

motivated to keep making links: e.g., Tomasello et al., 2005.

(Footnote 2) blind children are typically delayed: Peterson et al., 2000.

(Footnote 3) in one study Israeli parents: Feldman et al., 2006.

Nested processes are also involved: e.g., Dennett, 1987; Perner, 1991.

original paper on mental time: Suddendorf & Corballis, 1997.


mental disorders are extreme versions: Baron-Cohen, 2002; Crespi & Badcock, 2008.

disorders of theory of mind: e.g., Baron-Cohen, 1995; Brune, 2005; Brune & Brune-Cohrs, 2006; Peterson et al., 2005.

facial expressions of our basic feelings: Ekman, 1993; but see also Russell, 1994.


Extensive research on false-belief tasks: Wellman et al., 2001.

earlier in children who have older siblings: Ruffman et al., 1998.


attribute them to themselves: Gopnik & Astington, 1988.


John Flavell: Flavell et al., 1983.

to lie is to knowingly implant a false belief: e.g., Suddendorf, 2011; Talwar & Lee, 2008.

psychologists were nearly obsessed: Bloom & German, 2000.

the TV sitcom Friends: Junge & Lembeck, 1999.


faux pas: Baron-Cohen et al., 1999.

manage the impressions we give: Tedeschi, 1981.

They form expectations: Csibra et al., 1999.


Henry Wellman, Candi Peterson, and colleagues: Peterson et al., 2005; Shahaeian et al., 2011; Wellman & Liu, 2004.

shed tears to express: Humans are the only primates to shed tears, (Bard, 2003). Note that tears seem to contain a chemosignal (Gelstein et al., 2011).

(Footnote 5) Chimpanzee mothers and infants: Bard, 1994.
This is “theory of mind” in action: Suddendorf & Whiten, 2003.
The work of primatologists like: e.g., Goodall, 1986.
lean interpretations of their behavior: e.g., Povinelli & Bering, 2002; Povinelli & Eddy, 1996.
(Footnote 6) brain sizes have increased in tandem: Jerison, 1973.
capacity to reinterpret behavior in mental terms: Povinelli et al., 2000.
alternative explanation to this proposal: Suddendorf & Whiten, 2003.
(Footnote 7) chimpanzee aggressively chasing a female: de Waal, 1986.
Michael Tomasello and Josep Call: e.g., Tomasello et al., 1999; Call et al., 1998.
In collaboration with Brian Hare: Hare et al., 2000.
Rhesus monkeys similarly: Flombaum & Santos, 2005.
In an extension of Hare: Hare et al., 2001.
some great apes appear to recognize: Tomasello & Carpenter, 2005.
distinguish accidental from purposeful: Call & Tomasello, 1998.
discriminate between someone who is unwilling: Call et al., 2004.
distinguish appearance from reality: Krachun et al., 2009a.
when a competitor cannot see them: Hare et al., 2006.
Grey squirrels, for instance: Leaver et al., 2007.
Similarly, scrub jays: Clayton et al., 2007. For a killjoy critique, see van der Vaart et al., 2012.

no nonhuman animal has passed false-belief tasks: Call & Tomasello, 1999; Kaminski et al., 2008; Krachun et al., 2009b.
no other animal has anything like a theory of mind: Heyes, 1998; Penn et al., 2008; Penn & Povinelli, 2007.
They may have a limited: Call, 2001a; Whiten & Suddendorf, 2001.
lean and rich interpretations of data: Call & Tomasello, 2008; Hare, 2011; Povinelli & Vonk, 2003; Tomasello et al., 2003.
what they call “shared intentionality”: Herrmann et al., 2007; Tomasello et al., 2005.
a collaborative task with an adult: Warneken et al., 2006.
poor at using and providing social cues: Hare & Tomasello, 2004; Liszkowski et al., 2009; Melis et al., 2009.
when the options are far apart: Mulcahy & Call, 2009; Mulcahy & Suddendorf, 2011.
virtually only to request: Call & Tomasello, 1994; Povinelli et al., 1997.
only some 5 percent: Lyn et al., 2011.
A recent large-scale examination: Herrmann et al., 2007.
132 may not be comparable: de Waal et al., 2008.

Chapter 7: Smarter Apes
133 Man is most uniquely: Hoffer, 1973, p. 19.
134 Bees use optic flow: Chahl et al., 2004.
135 Research on intelligence: Neisser et al., 1996.
136 “intelligence is what the tests test”: Boring, 1923.
136 test scores have been increasing: Flynn, 2000.
137 resulting theories of intelligence: Deary et al., 2010; Neisser et al., 1996.
137 practical intelligence is quite distinct: Sternberg, 1999.
137 certain politicians spring to mind: A widely cited email hoax in 2001 claimed that some US presidents, including the then incumbent, had below-average IQ. For an attempt at assessment, see Simonton, 2006.
138 Pinker offers the following definition: Pinker, 1997, p. 62.
138 (Footnote 4) William James called “having interest”: James, 1890.
139 Man is a rational animal: Russell, 2009, p. 45.
139 numerous biases and heuristics: Tversky & Kahneman, 1974; Gigerenzer, 2001.
139 In hindsight we are sure: Hawkins & Hastie, 1990.
140 seven (plus or minus two) chunks: Miller, 2003.
140 a mere three to five chunks: Cowan, 2001.
140 speak of “working memory”: e.g., Conway et al., 2005.
140 working memory is the stage: Suddendorf & Corballis, 2007.
140 embedded processes are only possible: Read, 2008.
141 half of the variability in IQ: Oberauer et al., 2005; Oberauer et al., 2008.
141 steadily between ages four and eleven: Alloway et al., 2006.
141 Graeme Halford: Halford et al., 2007; Halford et al., 1998.
141 crucial factor in human cognitive evolution: Balter, 2010; Coolidge & Wynn, 2005.
141 (Footnote 6): Recent research suggests: Oberauer et al., 2008.
142 to decontextualize: Gerrans, 2007.
142 “Imagination is more important: Viereck, 1929, p.117.
143 The imagination is one: Darwin, 1871, p. 45.
143 recursion is a key mechanism: Corballis, 2007b, 2011.
Designing is the capacity: e.g., Suddendorf & Dong, 2013.


Embedded thinking: Suddendorf, 1999c

J. David Smith and colleagues: Smith et al., 1995.

Subsequent studies: e.g., Smith et al., 2003; Son & Kornell, 2005. A recent study found that in humans individual differences in introspective accuracy are associated with differences in brain structure, such as anterior prefrontal cortex gray matter volume and white-matter connections (Fleming et al., 2010).

claim the middle ground: Smith et al., 2012.

Wolfgang Köhler’s classic experiments: Köhler, 1917/1925.

he might have been a spy: Ley, 1997.

In one study gorillas and orangutans: Mulcahy et al., 2005.

other species manufacture tools: Bentley-Condit & Smith, 2010.

research station on the island of Mare: e.g., Hunt, 1996; Hunt & Gray, 2004.

use a tool to obtain another tool: Taylor et al., 2007.


Ravens, for example, are capable: Heinrich, 1995.

Taylor and colleagues recently: Taylor et al., 2010.

They made the most elementary mistakes: Herrmann et al., 2008; Povinelli, 2000.

natural stick tools: Mulcahy et al., 2013.

Several other results suggest: e.g., Furlong et al., 2008; Yocom & Boysen, 2011.

In one ingenious study: Mendes et al., 2007.

Several other apes tested: Hanus et al., 2011.

Rooks, corvids that are not known: Bird & Emery, 2009.

New Caledonian crows can learn: Taylor et al., 2011.

After ninety trials only one: Visalberghi & Limongelli, 1994.

Chimpanzees fared slightly better: Mulcahy & Call, 2006b; Povinelli, 2000.

Povinelli and his colleagues Penn and Holyoak: Penn et al., 2008.

some chimpanzees can avoid the trap: Seed et al., 2009.

New Caledonian crows were recently shown: Taylor et al., 2009.

(Footnote 10) hidden humans as causal agents: Taylor et al., 2012. But see subsequent debate: e.g., Dymond et al., 2013.


One study also found that a chimpanzee: Gillan et al., 1981.

the argument by Povinelli and colleagues: Penn et al., 2008.

stark individual differences: Flemming et al., 2008; Premack, 2012.

such spontaneous inferences: Call, 2006.

Call placed food in one of two cups: Call, 2004.

Figure 7.1: the female orangutan Punya: Hill, 2012.

Andrew Hill followed up: Hill et al., 2011.

(Footnote 13) we recently gave New Caledonian: Taylor et al.,
unpublished.

153 Tetsuro Matsuzawa and colleagues: e.g., Kawai & Matsuzawa, 2000.


154 In follow-up research humans: Cook & Wilson, 2010; Silberberg & Kearns, 2009.

154 Dwight Read: Read, 2008.

154 working-memory capacity in human evolution: Balter, 2010; Coolidge & Wynn, 2005.


155 Irving Biederman has called humans “infovores”: The word, 2006; Amir et al., 2011.

155 A classic study on zoo animals: Glickman & Sroges, 1966.


156 One study recorded the diversity: Parker, 1974a, 1974b; see also Torigoe, 1985.

156 (Footnote 14) Rates of behavioral innovation: Reader & Laland, 2003; see also Russon et al., 2010.

Chapter 8: A New Heritage

157 The primary difference: Dennett, 1995, p. 331.

158 (Footnote 1) “linguistic relativity”: e.g., Evans & Levinson, 2009; Hunt & Agnoli, 1991.

159 Other animals cooperate: e.g., de Waal, 2005; Wilson, 1975.


160 as one super-organism: e.g., Genet, 1997.


161 researchers used this exercise: Madsen et al., 2007.


161 (Footnote 4) the Cinderella effect: Daly & Wilson, 1988, 2005.

162 whether true altruism exists: e.g., Harman, 2010; Rachlin, 2002; Ridley, 1997.

162 (Footnote 5) Niko Tinbergen: Tinbergen, 1963.

163 may be called sociopaths: Mealey, 1995.

163 As Dawkins argued so persuasively: Dawkins, 1976.

163 (Footnote 6) cheater-detection mechanisms: Cosmides et al., 2005.


165 Cumulative culture has a role: Boyd et al., 2011; Dennett, 1995; Sterelny, 2003; Whiten et al., 2011.


165 (Footnote 7) Isaac Newton famously: Newton wrote this in a letter to Robert Hooke in 1676.

166 debates about the precise similarities: Godfrey-Smith, 2012; Mesoudi et al., 2006; Sterelny, 2003.

(Footnote 9) Once the island of Tasmania: Diamond, 1997; Flannery, 1994; Taylor, 2010.

a capacity for imitation from birth: Meltzoff & Moore, 1977, 1989; but see Anisfeld, 1991; Jones, 2006; Suddendorf et al., 2013.

By nine months infants can: Barr et al., 1996; Meltzoff, 1988.

infants begin to imitate rationally: Gergely et al., 2002.


The psychiatrist Justin Williams: Williams et al., 2001.

(Footnote 10) Our proposal has garnered: e.g., Kana et al., 2011; Oberman & Ramachandran, 2007; Rogers & Williams, 2006; Williams et al., 2006.


Research suggests that when: van Baaren et al., 2004.


(Footnote 11) behavioral synchrony is associated: Feldman, 2012.

(Footnote 11) Lack of social mirroring: Kouzakova et al., 2010.

teaching appears to be a cross-cultural: Hewlett et al., 2011; Tomasello et al., 1993a.


We can pass on questions: Corballis & Suddendorf, 2010.


share of the other’s food: de Waal, 1997.

In one study chimpanzees: Melis et al., 2006a.


preferentially from high-status individuals: Horner et al., 2010.


psychic connections: Sheldrake, 2009; Watson, 1979; but see Shermer, 1997.


In one study researchers trained: Whiten et al., 2005.

In a recent study on orangutans: Dindo et al., 2011.

The systematic comparison has yielded: Whiten et al., 1999; Whiten et al., 2001.

work on Sumatran orangutans: van Schaik et al., 2003.


dolphins break off sponges: Krutzen et al., 2005.


different types of social learning: Whiten & Ham, 1992.


Learning by copying others: Byrne & Russon, 1998.
(Footnote 14) often dubbed “emulation”: e.g., Hurley, 2008; Tennie et al., 2004.

chimpanzee and macaque infants: Ferrari et al., 2006; Myowa-Yamakoshi et al., 2004.
mirror neuron system was first: Rizzolatti & Craighero, 2004; Rizzolatti et al., 1996.
Male humpback whales: Smith et al., 2008.
Mike Noad observed: Noad et al., 2000.
in other humpback populations: Garland et al., 2011.
Off the coast of Brazil: Morete et al., 2003.
Louis Herman has shown: Herman, 2002.

notable exceptions are the great apes: Byrne & Russon, 1998; Russon & Galdikas, 1993.
mirror everything the chimpanzee: Nielsen et al., 2005.
documented in other great apes: Haun & Call, 2008.
mirrornzee Viki to copy: Hayes & Hayes, 1952.
“do as I do” paradigm: Byrne & Tanner, 2006; Custance et al., 1995; Miles et al., 1996.

presented chimpanzees with a puzzle box: Whiten et al., 1996.
(Footnote 15) One study did find: Paukner et al., 2009.
in other experiments chimpanzees: Whiten, 2005. One study suggests that enculturated chimpanzees can imitate rationally: Buttelmann et al., 2007.

In a seminal study Victoria Horner: Horner & Whiten, 2005.

Figure 8.2: Photo reprinted from Nielsen & Widjojo, 2011, with permission of Nova Science Publishers, Inc.

(Footnote 16) “transmission biases”: e.g., Boyd et al., 2011.
teaching in the animal kingdom: Caro & Hauser, 1992; Hoppitt et al., 2008; Thornton & Raihani, 2010.
Adult whales have been observed: Guinet & Bouvier, 1995.

In a recent study chimpanzees: Dean et al., 2012.

Chapter 9: Right and Wrong

Of all the differences between: Darwin, 1871, p. 97.
Johann Kremer: Johann Kremer’s Tagebuch in Auszügen, http://auschwitz-ag.org/unternehmen_auschwitz/6.2.7B.htm; see also Klee et al., 1991.
cooperation and cultural evolution: Gintis et al., 2008.
“cold” and “hot” processes: e.g., McIwain, 2003.
Michael Tomasello and colleagues: Liszkowski et al., 2008; Tomasello,

(Footnote 3) In psychopaths lack of sympathy: Blair, 2001; Mealey, 1995.


They initially require much prompting: Svetlova et al., 2010.

choices that avoid inequality: e.g., Fehr et al., 2008.


what de Waal referred to as level 2: de Waal, 2006.

“In the last analysis, every kind: Einstein, 1950, p. 71.


(Footnote 5) Game theory: Axelrod & Hamilton, 1981.

Ernst Fehr: e.g. Fehr & Gachter, 2002.

people are willing to punish: Boyd et al., 2003; Fehr & Fischbacher, 2003; Henrich et al., 2006.

studies on hunter-gatherer societies: Hill et al., 2009.

experiments in economics: Fehr & Fischbacher, 2004

We believe in a better world: e.g., Harre, 2011.

treat members of their own group differently: Brewer, 1979; Hewstone et al., 2002; Tajfel, 1982.

rituals, ethnic signaling, and other: Hill et al., 2009.

A key factor facilitating: For recent evolutionary perspectives on religion, see Bering, 2011; Dawkins, 2006; Dennett, 2007; Hitchens, 2007.


With the Enlightenment: Pinker, 2011a.

As man advances in civilisation: Darwin, 1871, pp. 122–123.


and later by Lawrence Kohlberg: Kohlberg, 1963; Piaget, 1932.

imagine a situation in which you: Hauser, 2006; Mikhail, 2007; Nichols & Mallon, 2006.

moral intuitions often precede: e.g., Haidt, 2007; Huebner et al., 2009.


(Footnote 7) These draw in part: Greene & Haidt, 2002; Nesse, 1998; Trivers, 1971.

reasoning is marred by certain biases: Gilbert, 2006; Gilbert & Wilson, 2007, 2009.

motivated to choose future-directed actions: Suddendorf, 2011.

the marshmallow test: Mischel & Mischel, 1983; Mischel et al., 1989.

Differences in children’s self-control: Casey et al., 2011; Shoda et al., 1990.

(Footnote 8) Darwin wrote: Darwin, 1871, p.123.


Donald Rumsfeld observed: Rumsfeld, 2002.

remember their own good behavior better: D’Argembeau & Van der Linden, 2008.
(Footnote 10) To call this self-deception: Pinker, 2011b.
The fact that man knows: Twain, 1906, p. vi.
(Footnote 11) A similar social explanation: Suddendorf, 2011.
Jane Goodall found: Goodall, 1986.
At 1710 Melissa, with: Goodall, 1986, p. 351.
Chimpanzee infanticide may happen: Murray et al., 2007.
It has also been observed in: Goodall, 1986; Henzi et al., 2010.
comfort others who are suffering: Boesch, 1992; de Waal, 1996; Goodall, 1986.
Researchers analyzed spontaneous: de Waal & Aureli, 1996.
rodents are sensitive to pain of: Bartal et al., 2011; Langford et al., 2006; Rice & Gainer, 1962.
the gorilla was hand-reared: Silk, 2010.
stories of helping, such as Washoe: Fouts, 1997.
fundamentally good-natured: de Waal, 1996.
groom each other and so build alliances: e.g., Hemelrijk & Ek, 1991.
subsequently help each other: Boesch, 1992; Yamamoto et al., 2009
in one study chimpanzees: Melis et al., 2008.
share because they are harassed: Gilby, 2006.
(Footnote 14) Karl Pribam’s finger: Peterson, 2006.
(Footnote 15) One study suggests that: Gomes & Boesch, 2009.
chimpanzees failed to help other: Jensen et al., 2006; Silk et al., 2005.
study reported some prosocial choices: Horner et al., 2011.
marmosets, tamarins, and capuchin monkeys: Burkart et al., 2007; Cronin et al., 2010; Lakshminarayanan & Santos, 2008.
Limits to sharing severely restricts: Melis et al., 2006b.
Interestingly, three-year-old: Hamann et al., 2011.
Recent work on rhesus macaques: Mahajan et al., 2011.
requires “shared intentionality;”: Rakoczy et al., 2008; Tomasello, 2009; Tomasello et al., 2005.
Shirley Strum: Strum, 2008; see also von Rohr et al., 2011.
work out of frustration: Dubreuil et al., 2006; Roma et al., 2006; Wynne, 2004; but see van Wolkenten et al., 2007.
Other studies have found some: Brosnan et al., 2005; Range et al., 2009; but see Brauer et al., 2009; Jensen et al., 2007.

“community concern”: de Waal, 2006.

In one study rhesus monkeys: Hauser & Marler, 1993.

moral norms are critical: Fehr & Fischbacher, 2004; Stevens & Hauser, 2004; Tomasello, 2009.

(Footnote 18) only humans blush: Darwin, 1873.

(Footnote 18) remedial display: Leary & Meadows, 1991.

precursors of social norms: von Rohr et al., 2011.

A moral being is one: Darwin, 1871, p. 610.


lexigrams “good” and “bad”: Lyn et al., 2008.

should be given legal personhood: Wise, 2000.

delay receiving a small reward: Dufour et al., 2007; Rosati et al., 2007.

In one study chimpanzees waited: Evans & Beran, 2007.


In 2002, Frodo: Demonic ape, 2004; for other chimpanzee attacks on humans, see Hockings et al., 2010.


needs and preferences into account: Stamp Dawkins, 2012.

Steven Pinker has documented: Pinker, 2011a.

Chapter 10: Mind the Gap


rats can cognitively sweep ahead: Johnson & Redish, 2007.


the maze layout and its options: Gupta et al., 2010; Gupta et al., 2012.

The challenges of navigation: Recent debate about the implications of this research for the question of mental time travel in animals: Corballis, 2013a, 2013b; Suddendorf, 2013.

Great apes have a basic capacity to imagine: Suddendorf & Whiten, 2001.

not entirely unlike (adult) scientists: Gopnik, 2012.

They begin to deploy counterfactual reasoning: Harris et al., 1996; Rafetseder et al., 2010


Children also learn how thought: Children’s executive control predicts later measures of health and success: Moffitt et al., 2011; for programs aiding its development, see Diamond & Lee, 2011.

consciousness is a broadcasting system: Baars, 2005.

(Footnote 1) The theater metaphor does not: see Dennett & Kinsbourne, 1992.
improve the accuracy of their mental scenarios: Gilbert, 2006.
Humans have taken this sociality: Barrett, Henzi, & Kendall, 2007; Frith & Frith, 2010.
As Michael Tomasello and colleagues have: Herrmann et al., 2007; Tomasello, 2009; Tomasello et al., 2005; Tomasello & Herrmann, 2010.
“enculturated,” perform slightly better: Tomasello et al., 1993b.
No other animal passes: Herschel, 1830, pp. 1–2.
(Footnote 4) Donald Hebb: Meaney, 2001; for recent discussion of the innateness concept, see Mameli & Bateson, 2011.
(Footnote 5) It is not entirely clear: de Waal et al., 2008.
Human brains grow more outside the womb: DeSilva & Lesnik, 2006.
anthropologist Barry Bogin: Bogin, 1999; Locke & Bogin, 2006.
breastfeeding typically ends: Kennedy, 2005; Sellen & Smay, 2001.
brain peaking in mass: Cabana et al., 1993.
Chimpanzee birth intervals: Hill et al., 2009.
white matter increases: Paus et al., 1999.
Executive self-control gradually improves: Luna et al., 2004; Luna et al., 2001.
cooperative breeding: Hill et al., 2009.
(Footnote 7) some aspects of the brain: e.g., Asato et al., 2010; Lebel et al., 2012.
While some great apes outlive: Walker & Herndon, 2008.
Grandmothers provide a range of support: Hawkes, 2003; Hawkes et al., 1998; but see Hill et al., 2009.
helps propagate genes: Lahdenpera et al., 2004; Sear & Mace, 2008.
surviving to age seventy and beyond: Gurven & Kaplan, 2007.
notions of wisdom: Staudinger & Gluck, 2011.
humans frequently caused mass extinctions: e.g., Alroy, 2001; Holdaway & Jacomb, 2000; Roberts et al., 2001; Turney et al., 2008.
(Footnote 8) marmosets breed in small groups: Tardif, 1997.

Chapter 11: The Real Middle Earth

eighty graves nearby: 3.000 Jahre alte Gräber, 2005.
oldest continuously recorded family tree: Wang 2009.
Australian Aboriginals have: Flannery, 1994.
Analyses of the Y chromosomes: Hammer et al., 1998; Thomson et al., 2000.

Analyses of mitochondrial DNA: Cann et al., 1987; Vigilant et al., 1991; Watson et al., 1997; see also Ayala, 1995; Soares et al., 2009.

The oldest anatomically modern: McDougall et al., 2005; Leakey, 1969.


(Footnote 1) A recent study challenges: Cruciani et al., 2011.

(Footnote 1) Genghis Khan: Zerjal et al., 2003.

The oldest anatomically modern: McDougall et al., 2005; Leakey, 1969.


(Footnote 1) A recent study challenges: Cruciani et al., 2011.

(Footnote 1) Genghis Khan: Zerjal et al., 2003.

Figure 11.1: Derevianko, 2012; Mellars, 2006; Soares et al., 2009; Stanford et al., 2013.

the birds rapidly went extinct: Holdaway & Jacomb, 2000.

the ecosystem collapsed: Diamond, 2005.

some interbreeding with the newcomers: Green et al., 2010; Reich et al., 2011.

Australopithecus africanus: Dart, 1925.

Some paleoanthropologists are more inclined: Robson & Wood, 2008.


(Footnote 3) Even in biology there is: Groves, 2012a, 2012b; Mayr, 1940.

Figure 11.2: Groves, 2012a; Jurmain et al., 2011; Robson & Wood, 2008; Stanford et al., 2013.

theories about the subsequent anthropogenesis: aimed throwing (Calvin, 1982); brain cooling (Falk, 1990); endurance running (Bramble & Lieberman, 2004); collective punishment and enforcement of rules (Bingham, 1999); pair bonding and cooperative breeding (Deacon, 1997); fire and cooking (Wrangham, 2001); baby sling (Taylor, 2010); symbols (Deacon, 1997; Lock & Peters, 1996; Noble & Davidson, 1996).

initially split 7 million years ago: Patterson et al., 2006; for questions about the split from gorillas, see Marks et al., 1988.

(Footnote 4) the aquatic ape theory: Morgan, 1982; for a critique, see Langdon, 2006.

Chimpanzees and humans are more closely: Sibley & Ahlquist, 1984.

more similar to that of the gorilla: Scally et al., 2012.

Sahelanthropus tchadensis: Brunet et al., 2002; but see Wolpoff et al., 2002.

cranial capacity of: Unless otherwise specified hominin cranial capacities throughout this chapter are based on Robson & Wood, 2008.


Ardipithecus ramidus: Lovejoy et al., 2009; White et al., 2009. For cranial capacity, see Suwa et al., 2009.


derived from bipedal clambering: Thorpe et al., 2007.


Bipedalism is not necessarily: Pontzer et al., 2009; Sockol et al., 2007.
shape the infant’s maturing brain: Gibbons, 2008.
capable of power and precision grips: Young, 2003.
“man the hunted”: Hart & Sussman, 2005.
the lunate sulcus: Dart, 1925.
fossilized footprints: Leakey & Hay, 1979; Crompton et al., 2012.
(Footnote 7) Dart’s conclusion was challenged: Falk, 1980; Falk et al., 2000; Holloway, 1981; Holloway et al., 2004.
(Footnote 7) In a personal history: Holloway, 2008
(Footnote 8) like those of modern humans: Ward et al., 2011.
(Footnote 8) 3.4-million-year-old foot: Haile-Selassie et al., 2012.
The pubic louse, DNA comparison: Reed et al., 2007.
louse that lives in clothes: Toups et al., 2011; see also Kittler et al., 2003. The earliest evidence of garments, flax fibers, are some thirty thousand years old (Kvavadze et al., 2009).
3.39-million-year-old bones: McPherron et al., 2010; but see Dominguez-Rodrigo et al., 2012.
oldest stone tools: Semaw, 2000; Dominguez-Rodrigo et al., 2005.
Australopithecus garhi: Asfaw et al., 1999.
Australopithecus bahrelghazali: Brunet et al., 1996.
Australopithecus sediba: Berger et al., 2010.
probably ate a variety of foods: Grine, 1986; Ungar & Sponheimer, 2011.
bone tools to dig: Backwell & d’Errico, 2008.
appeared around 2.4 million years ago: Stedman et al., 2004.
Homo habilis: Leakey et al., 1964.
1.95-million-year-old butchering site: Braun et al., 2010.
transported objects: Braun et al., 2009; Plummer, 2004.
tools were of good throwing size: Cannell, 2002.
Their footprints are essentially: Bennett et al., 2009.
more quickly than modern humans: Graves et al., 2010.
(Footnote 11) split into several species: e.g., Groves, 2012a.
consumed more meat: Stanford et al., 2013.
Reduced fur and whole-body: Ruxton & Wilkinson, 2011.
becoming a top predator: e.g., Shipman & Walker, 1989.
grandmother effect: Hawkes et al., 1998; O’Connell et al., 1999.
(Footnote 13) Overheating has also been: Falk, 1990.
cooking of food was the crucial step: Wrangham, 2009; Wrangham, 2001.
evidence for early fire use: Goren-Inbar et al., 2004; Berna et al., 2012.

(Footnote 14) Quest for Fire: Annaud, 1981.


they are evident in Spain: Carbonell et al., 2008.


40,000 and 70,000 years ago: Yokoyama et al., 2008.

27,000 years ago: Swisher et al., 1996.

diversity of foods: Ungar et al., 2006; Ungar & Sponheimer, 2011.

Acheulean stone-tool industry: e.g., Wynn, 2002.

(Footnote 16) The role of refugia: Stewart & Stringer, 2012.

tools were carried over distances: Hallos, 2005.

1.76 million years ago: Lepre et al., 2011.

tools became thinner and more: Stout, 2011.

aimed throwing to bring down prey: Calvin, 1982; Zhu & Bingham, 2011; see also Hopkins et al., 2012.

look like a Broca’s area: Holloway, 1976; Wu et al., 2011.


skull from Dmanisi: Lordkipanidze et al., 2005.

(Footnote 18) relation between the thickness: Jungers, 1988.

(Footnote 20) possibly shared intentionality: Shipton, 2010.

Homo antecessor: deCastro et al., 1997.

A spine of a five-hundred-thousand-year-old: Bonmati et al., 2010.

cooperated to bring down big game: Villa & Lenoir, 2009.

four-hundred-thousand-year-old spears: Thieme, 1997; see also Churchill & Rhodes, 2009.


From around three hundred thousand years ago: Ambrose, 2001; Lombard, 2012; but see Shea, 2006.

early as five hundred thousand years ago: Wilkins et al., 2012.

over two hundred fossils: Stanford et al., 2013; Trinkaus, 1995.

pale skin and red hair: Lalueza-Fox et al., 2007.

up to western Siberia: Krause et al., 2007b.

largely depended on meat: Richards et al., 2000.

including fish and dolphins: Stringer et al., 2008.


draft sequence of their genome: Green et al., 2010.

DNA extracted from thirteen: Dalen et al., 2012.


Neanderthal burials: Langley et al., 2008; Solecki, 1975; but see Balter, 2012a.

having made composite tools: Langley et al., 2008.


worn shells as jewelry: Zilhao et al., 2010.

Archaeologists are hotly debating: Balter, 2012b.

Neanderthal hyoid bone: Arensburg et al., 1990.

hyoid bone from an earlier archaic: Martínez et al., 2008.

hyoid bone of an *Australopithecus aferensis*: Alemseged et al., 2006; also, a partial *H. erectus* hyoid was found (Capasso et al., 2008).

version of a gene strongly implicated: Krause et al., 2007a.

gesturing preceded talking: Corballis, 2003, 2004; for controversies over language evolution, see, e.g., Bickerton, 1995; Corballis, 2009; Deacon, 1997; Lock & Peters, 1996; Noble & Davidson, 1996.

modern human life history: Smith et al., 2007.


at Skuhl Cave: Grun et al., 2005.

82,000-year-old shell beads: Bouzouggar et al., 2007.


(Footnote 21) A mutation of the FOXP2 gene: Enard et al., 2002.


40,000 years ago artifacts: Balter, 2012c.

Chauvet Cave: Clottes et al., 1995.


prehistoric cave of Geissenklösterle: Balter, 2012b.

the painting tells a story: E.g., Irwin, 2000.

behavioral complexity increased: Langley et al., 2008.

In some instances the technologies: d’Errico & Stringer, 2011.

The archaeological record complicates: Lombard, 2012.


Denisovans are the Asian: Derevianko, 2012; Krause et al., 2010; Reich et al., 2010.

appear to have interbred: Reich et al., 2011.

*Homo floresiensis*, tiny hominins: Brown et al., 2004; Morwood et al., 2005.

sophisticated stone tools: Brumm et al., 2006.

debates about whether these specimens: e.g., Argue et al., 2006; Brown, 2012; Falk et al., 2009; Martin et al., 2006; Oxnard et al., 2010.

(Footnote 22) There are some problems: O’Connell et al., 1999.

(Footnote 23) In 2012, strange: Curnoe et al., 2012.

“at all times throughout the world: Darwin, 1871, p. 132.


(Footnote 25) Darwin wrote: Darwin, 1871, p. 132.

(Footnote 25) group selection continues to be: e.g., Dawkins, 2008; Mesoudi & Whiten, 2008; Wilson & Sober, 1994; Wilson & Wilson, 2007; see also http://edge.org/conversation/the-false-allure-of-group-selection#edn9.


northern Iraq (Shanidar 3): Churchill et al., 2009.

The jaw of a 30,000-year-old: Ramírez Rozzi et al., 2009.

paradigm shift: Gibbons, 2011.
African data also suggest interbreeding: Hammer et al., 2011.

Chapter 12: Quo Vadis?

eight times the biomass: Smil, 2002.

the first script was: Schmandt-Besserat, 1981, 1992.

The first cities and temples: The first temple is thought to be at an eleven-thousand-year-old site, Gobekli Tepe, in Turkey (Peters & Schmidt, 2004); but see also Banning, 2011.

including their languages: Bouckaert et al., 2012.

(Footnote 2) Those who continued: Brody, 2000.

historical novel Creation: Vidal, 1981.

(Footnote 3) Writing systems in other parts: e.g., del Carmen Rodriguez Martinez et al., 2006; Dematte, 2010.

(Footnote 3) Stanislas Dehaene: Dehaene, 2009.


Within a century the number of books: Sagan, 1980.

Philosophical Transactions of the Royal Society: See http://royalsociety-publishing.org/journals/.

John Herschel: Herschel, 1830.

Systema Naturae: Linnaeus, 1758.

to make models and predictions: e.g., Borjeson et al., 2006.

Environmental impact studies: e.g., Linke et al., 2011; Stewartoaten et al., 1986.

recognized as global problems: Diamond, 2005; Rockstrom & Klum, 2012; Singer, 2002.


critical to complement the genetic data: Varki et al., 1998; Varki et al., 2008.

narrow down the search space: Suddendorf & Butler, 2013.

genetic changes in human populations: Milot et al., 2011.

brain sizes decreased: McAuliffe, 2010; Ruff et al., 1997.

brain size and IQ: McDaniel, 2005; for factors influencing hominid brain size evolution, see Bailey & Geary, 2009.


Countless civilizations have collapsed: Diamond, 2005.


we have domesticated ourselves: Groves, 1999; Hare et al., 2005, 2012.


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


REFERENCES


