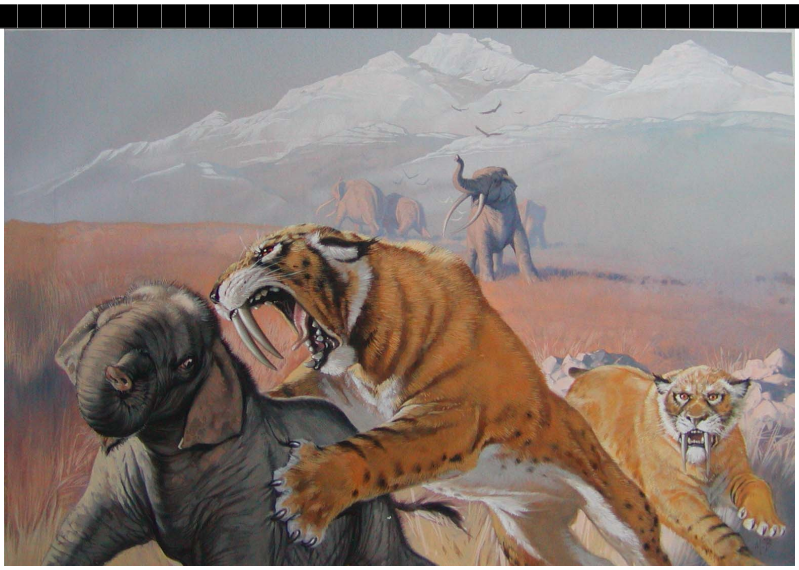
The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE



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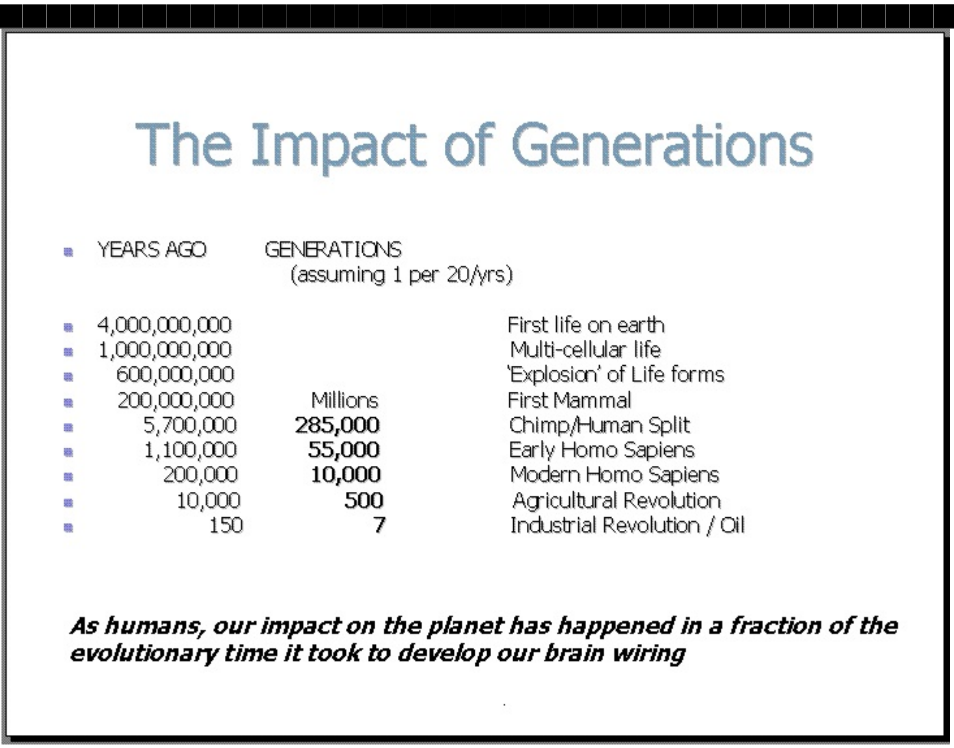

The Impact of Generations

YEARS AGO	GENERATIONS (assuming 1 per 20/yrs)	
4,000,000,000		First life on earth
1,000,000,000		Multi-cellular life
600,000,000		'Explosion' of Life forms
200,000,000	Millions	First Mammal
5,700,000	**285,000**	Chimp/Human Split
1,100,000	**55,000**	Early Homo Sapiens
200,000	**10,000**	Modern Homo Sapiens
10,000	**500**	Agricultural Revolution
150	**7**	Industrial Revolution / Oil

As humans, our impact on the planet has happened in a fraction of the evolutionary time it took to develop our brain wiring

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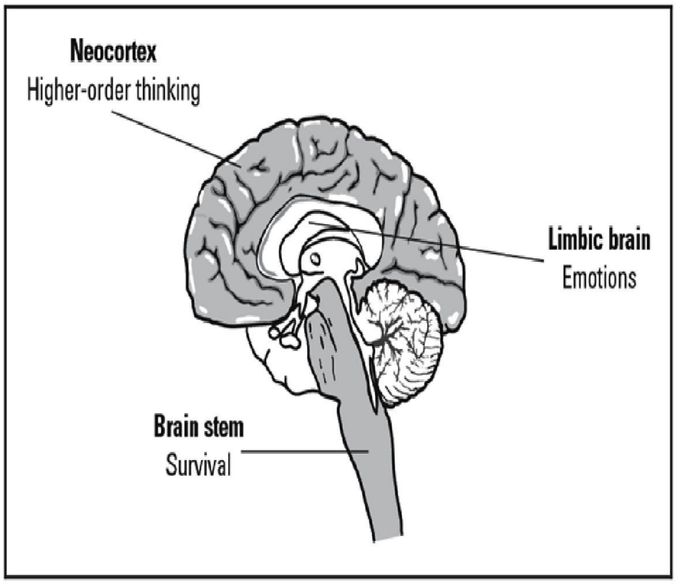
Neocortex
Higher-order thinking
Limbic brain
Emotions
Brain stem
Survival

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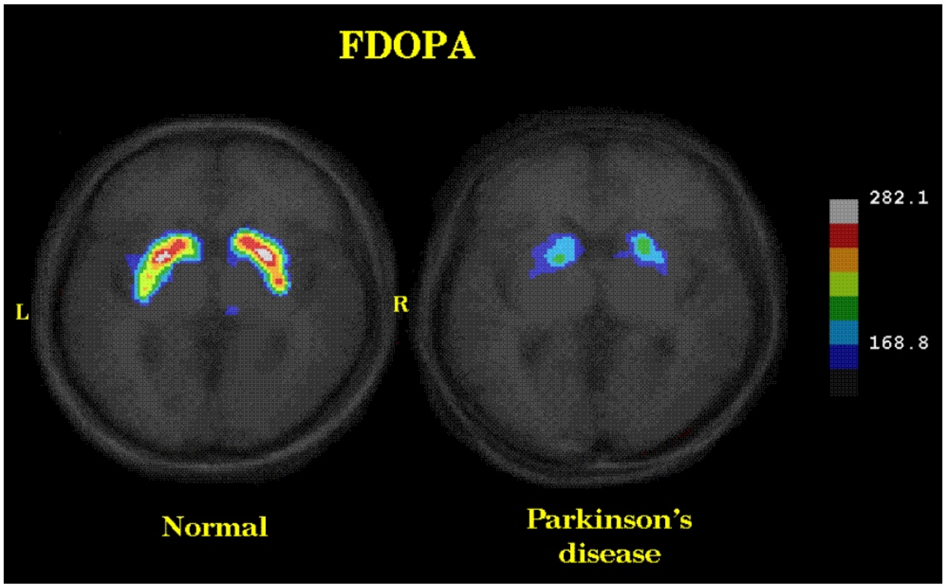
FDOPA
L
R
282.1
168.8
Normal
Parkinson’s disease

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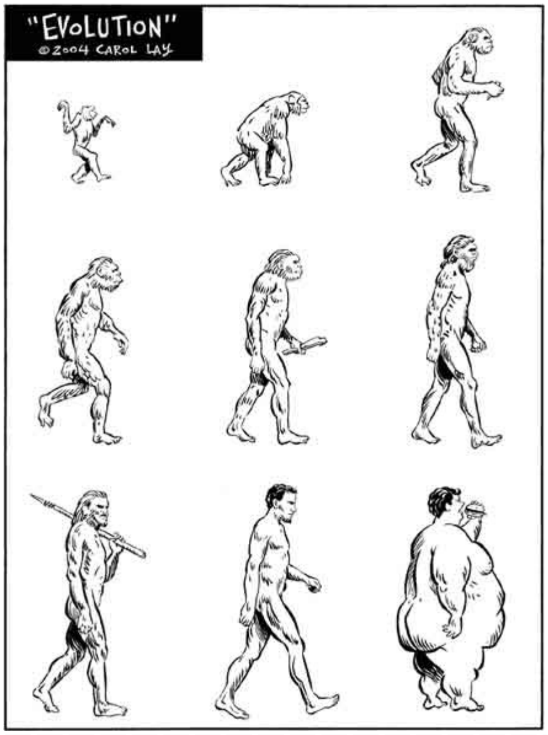

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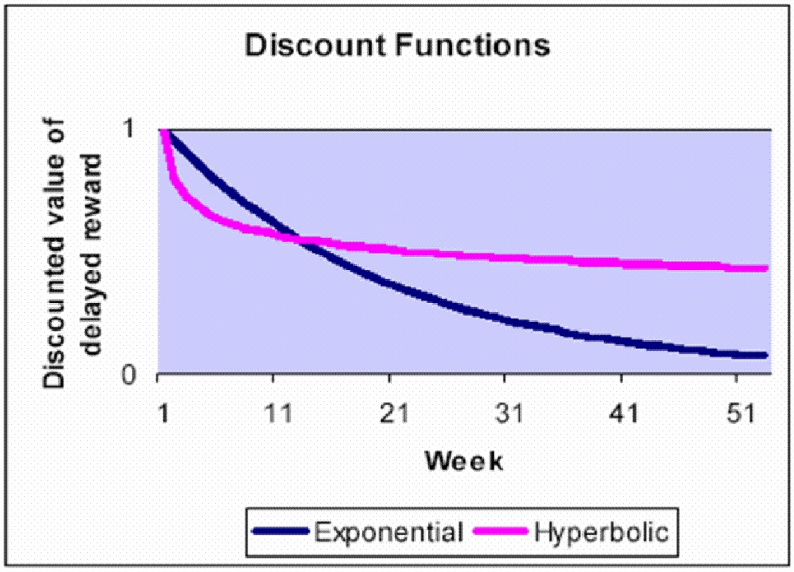

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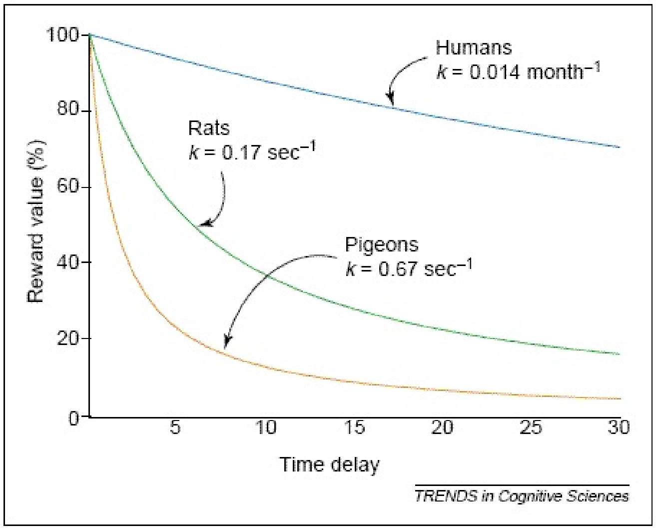

TRENDS in Cognitive Sciences

Figure 3. The discounting rate describes the steepness of the discounting function – that is, how quickly the reward is devalued over time. The hyperbolic model of discounting is described by $V = A/(1 + kD)$, where V is the subjective value of the reward, A is the amount of the reward, D is the delay to reward, and k is a free parameter describing the discounting rate. This discounting rate k has been estimated for pigeons and rats, suggesting that both species rapidly devalue food delayed in a matter of seconds [27,28]. Similar experiments on humans suggest that we devalue money at a much lower rate, on the order of months rather than seconds [29]. (Note that the Time delay axis has dual units. Discounting functions plotted from k values reported in Mazur [27], Richards *et al.* [28], and Rachlin *et al.* [29]).

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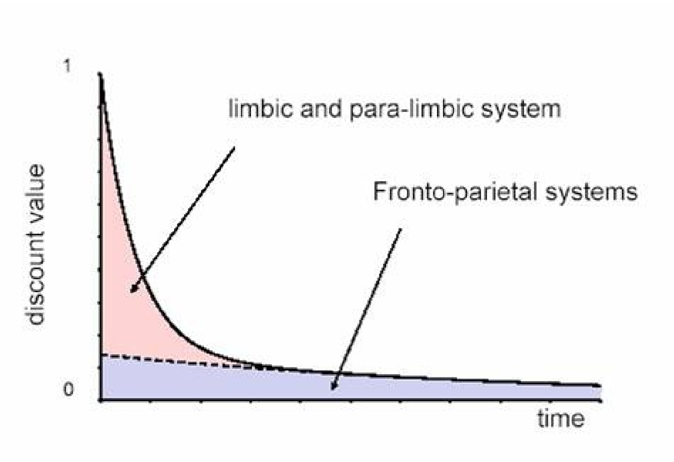

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Table 2. Representative empirical studies linking estimated discount rates for monetary rewards to various individual behaviors and traits. Studies marked with an asterisk (*) used hypothetical rewards; others used real rewards. N = total # of participants in study.

Variable	Study	N	Discount Rate Findings
Nicotine	Bickel, Odum, & Madden (1999)*	66	Current smokers > never-smokers and ex-smokers
Alcohol	Bjork, Hommer, Grant, & Danube (2004)	160	Abstinent alcohol-dependent subjects > controls
Cocaine	Coffey, Gudleski, Saladin, & Brady (2003)*	25	Crack-dependent subjects > matched controls[a]
Heroin	Kirby, Petry, & Bickel (1999)	116	Heroin addicts > age-matched controls
Gambling	Petry (2001b)*	86	Pathological gamblers[b] > controls
Risky Behavior	Odum, Madden, Badger, & Bickel (2000)*	32	Heroin addicts agreeing to share needle in a hypothetical scenario > non-agreeing addicts
Age	Green, Fry, & Myerson (1994)*	36	Children > young adults > older adults
Psychiatric Disorders	Crean, de Wit, & Richards (2000)	24	"High risk" patients[c] > "low risk" patients
Cognitive Ability	Benjamin, Brown, & Shapiro (2006)	92	Low scorers on standardized mathematics test > high scorers

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