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Dr. Thomas Frankl, 2015, Longevity matters: the Case for Corporate Anti-Ageing

The average live span of companies in the United States, Japan and most of Europe is around 13 years[i]. Over the last century, the average lifespan of a company listed in the S&P 500 has decreased by more than 50 years, from 67 years in the 1920s to 15 years today[ii]. One third of the companies featured in the 1970 S&P 500 did not exist beyond 1983. The typical manifestations of corporate fatality were take-overs, bankruptcy or break-up[iii].

As far as human lives are concerned, 'quality of life' assured by mental and physical health and wellbeing needs to complement old age in order to make longevity a worthy objective. Similarly, corporate longevity, the continuous existence of companies over many decades, if not centuries, cannot be considered a worthy aspiration for their owners, unless it is accompanied by the presence of corporate health factors such as stakeholder satisfaction, continuous innovation or adequate profitability. This said, excellence might not in all cases be a pre-condition for longevity: mediocrity does not have to stand in the way of longevity if an otherwise unremarkable business is benefiting from a monopolistic position, constituting an insurmountable barrier of entry to any would-be competitor. In fact, a large number of long-lived companies operate in the tertiary sector and are located in a unique, attractive location: hotels and restaurants located in city centers or central business districts, in unique scenic locations (e.g. Villa d'Este on Lake Como, Italy, founded 1568) or other unique 'recreational locations' (e.g. Hoshi Ryokan hotel & spa, Komatsu, Japan, founded 718). It is primarily their unique location, which creates a quasi-unassailable competitive 'moat'[iv], as long of course as the location itself retains its value - attractiveness of location may be affected by changes in the competitive environment of businesses, e.g. a change in social preferences: Japanese *millenials* might prefer downloading a 'Spa App' on their tablet over getting their feet wet; environmental changes such as global warming may soon begin to threaten wineries such as the German Schloss Johannisberg (founded 768) whose typical grape variety might become indistinguishable from others as alcohol levels rise due to a warmer climate[v]; high-speed trains have made a major part of air travel within France obsolete[vi], eroding the former quasi-monopolistic position of most of France's regional airports.

Given the decisive impact location can have on the longevity of a given business, this essay focuses on the analysis of the non-location related factors which enabled companies to survive over the long term. The author sets out to determine which attributes and strategic choices long-lived companies have in common, i.e. which strategic decisions have contributed materially to their long-term survival in free markets. Are there any lessons to be learned from the experience of public corporations and private family businesses who may be facing strategic decisions in order to remain competitive and relevant ? What could be the nucleus of a corporate anti-ageing strategy ?

A look at Public Companies

In the early 1980, Royal Dutch Shell could look back at almost 100 years of existence – quite unusual for one of the world's largest diversified corporations, made up of over 300 companies operating across the globe[vii]. The corporate history of Shell dates back to the 1890s when its British founders started selling petroleum for lamps in the Far East[viii]. The company merged with kerosene importer Royal Dutch in 1906, now focusing on the production of oil and its derivatives. As a response to the 1970s oil crisis, Shell diversified *inter alia* into metals, chemicals and nuclear power. The mixed success of its diversification strategy triggered an intense soul-searching process at board level. Lo van Wachem, then chairman of Shell commissioned an internal study written by two of its corporate planners and two business school professors, to examine companies of similar size and global scale, which during their long history had successfully weathered periods of fundamental change in their business environment. The authors of the 'Shell Study'[ix] could only identify 40 out of ca. 40,000 corporations in the industrialized world that would meet the criteria, 27 of which were studied in detail. What they established were four key factors these long-lived large corporations had in common[x]:

1. They were sensitive to the environment, constantly tuned to changes in their environment, and reacted in a timely fashion;
2. They were 'cohesive', offering their employees a sense of belonging, identification and meaning;
3. They were, within the boundaries of the cohesive organization, tolerant and supportive of activities at the margin such as eccentricities and experiments;

4. They were financially conservative: they had a culture of frugality, refrained from bold risk-taking and built financial reserves in good times.

In Praise of the Family Business

Walking down an imaginary 'gallery of ancestral companies' still alive tody – companies such as French paper manufacturer Richard de Bas (*1326), Italian bell foundry Marinelli (*1040) or the Finnish household hardware maker Fiskars (*1649), what strikes the observer first is that all are closely-held private family businesses[xi]. Evidence suggests that inadequate corporate governance, and more specifically, the failure to address the 'agency problem'[xii], lies at the origin of premature demise of public corporations. Not so for family-owned businesses - but for what reasons ? Family members with a dual role of executives and board members prevent the agency problem to occur in the first place: as owner-managers, a conflict of interest cannot arise because the family manager's ownership interests will prevail over their interest in maximizing management compensation. In other words, family members have 'skin in the game', which implies that they suffer the consequences of any major management errors, possibly extending to a total loss of their heritage. Nassim Taleb, an outspoken proponent of the application of the 'skin in the game' heuristic to corporate governance, pins the ephemerality of corporations to the very absence of this principle in governance: "(Managers') allegiance is to their own personal cash flow. They will not be harmed by subsequent failures, they will keep their bonuses, as there is currently no such thing as negative manager compensation (…) Corporations are so fragile, long-term, that they eventually collapse under the weight of the agency problem, while managers milk them for bonuses (…)"[xiii].

There are many examples of the applied 'skin in the game' heuristic[xiv] playing out in favor of corporate longevity: the excesses leading up to the 2008 financial crisis, culminating in the demise of Bear Stearns and Lehman Brothers, and the bail-out by taxpayers of global bank corporations such as UBS or regional financial institutions such as Countrywide did not occur at any of the private banks, inasmuch as their owners were 'GP's' - general partners subject to unlimited liability for their actions. As a consequence, private banks did not take any of the financial risks of their counterparts in bank corporations, who knew that in the worst case they could loose their jobs, but not their shirts. By the same token, family businesses tend to be risk-averse, even if this means loosing out to competitors on promising new business opportunities[xv]. The key contributing factor fundamental to the risk-awareness of family businesses is rooted in social control: risky bets gone wrong inevitably affect cohesion within the family[xvi]. The failed executive of a corporation can always find a new company to manage, a failed family business manager cannot apply for a new family.

Successful family businesses tend not to be naïve about the realities of potential family conflicts, but take efforts to devise effective, family-specific governance mechanisms: "The most ambitious family businesses have long recognized that if they want the business to last and not be damaged by the inevitable stresses that families are subject to, they must take their governance seriously….(by drafting) their own private codes and constitutions."[xvii]

Obviously, family businesses are not immune to failure, either - evidence merely suggests that family businesses are more enduring than non-family businesses[xviii]. Nevertheless, two thirds of family businesses fail between the first and second generation and only 12 percent reach a third generation. Only three to four percent of third generation survivors make it to fourth generation[xix], by which time the statistical chances for survival for future generations begins to increase: "The fourth generation (of a family business) is sufficiently well-off, as a rule, for the ablest of them to want to pursue their own interest and their own careers rather than dedicate themselves to business."[xx] When family businesses eventually fail, the most common causes are related to succession.[xxi]

1428 Years of Success: The Case of Kongō Gumi

The longest-lived business in history, Japanese construction company Kongō Gumi, mastered 40 successions until disaster finally struck. Its history dates back to the year 587 A.D., when Prince Shōtoku, the founder of Buddhism in Japan[xxii], commissioned the building of the first Buddhist temple in Japan. Shōtoku selected a Korean master builder, named Kongō Shigemitsu. It took fifteen years and three of Kongō's sons to complete the temple. During that time Shōtoku ruled Japan and granted imperial support for the building of other temples, among which the Hōryō-ji temple, whose seventh-century five-story pagoda stands today as the world's oldest wooden structure.

Once every 100 years on average, such structures, nearly 80,000 of which exist in Japan today, required maintenance, reconstruction or repair - not counting the destructive effects of fires, storms, earthquakes and armed conflict, providing further business opportunities for temple builders. The Kongō family was well placed to gain such repeat business, having established the oldest brand of temple builders in Japan.

Kongō Gumi[xxiii] thrived throughout the centuries, taking political unrest, hard and good times in stride, until the modernization and secularization of the country during the Meiji Restoration (1868-1912) brought previously unseen challenges, forcing Kongō Gumi to compete in open markets for the first time. During World War II, with no funds available to reconstruct temples and shrines, Kongō Gumi switched to making coffins to ensure their survival. As business picked up again after the war, the company reverted to its traditional business.
During the 1980, finally, began a period of decline, which culminated in Kongō Gumi's bankruptcy after 1428 years of continued existence as an independent family business.
As is often the case, it was not a single event which lead to a catastrophic outcome, but a combination of adverse influences: Three fundamental changes threatened Kongō Gumi's existence: a) the pace of secularization, having begun with the Meiji Restoration, had accelerated as the population became increasingly westernized b) Japan's real estate boom which begun in 1986 had sent land prices skywards, making new temple construction increasingly unaffordable c) innovations by Kongō Gumi and other construction companies had introduced state-of-the-art building technologies, namely concrete support structures and unobtrusive fire-safety features[xxiv], making temples and shrines more resistant to natural disasters, hence lengthening maintenance cycles. These three changes translated into a permanent fall in revenues and profits, presenting only two existential strategic alternatives for Kong Gumi's management:

a) Shrink the company to match a smaller market
b) Develop new income streams to compensate for the structural revenue shortfall

Alternative a) would have implied laying-off skilled staff, which for a number of reasons was not considered a viable option: apart from cultural considerations[xxv], laying-off trained craftsman would have borne the risk of eroding the company's very competitive advantage, as its most skilled craftsmen might have looked elsewhere for job security. Masakazu Kongō, the 40th head of the business expressed the dilemma as follows: "Japan's economic conditions are not favorable, but we have to make sure our employees make money to live. We can't make the company smaller."[xxvi]

At this juncture, Masakazu Kongō committed a strategic blunder, putting an end to 1428 years of corporate survival: he decided to establish a new branch, which would focus on the development of office buildings and apartment complexes. However, in the general construction industry the company's competitive advantage and core competencies were irrelevant. Industrial-style construction calls for low-cost building know-how, including the use of pre-fabricated concrete and steel elements, with which Kongō Gumi had no experience, let alone any advantage over their competitors. To the contrary, economies of scale provided substantial cost advantages to big construction firms, which explains the dominance of large construction companies over smaller ones, and the concentration process typical for this industry. Worse still, rather than position the company as a mere contractor, Kongō Gumi became a developer, assuming the commensurate high financial risks. Over the course of several years, the 104-employee company took on debt to the equivalent of USD 343 M to finance land acquisition and construction. When the real estate bubble burst in the 1992-93 recession, the collateral securing Kongō Gumi's bank loans lost value, breaching bank loan covenants and triggering insolvency. Major Japanese construction company Takamatsu acquired the company in 2006 and absorbed into one of its subsidiaries. This marked the end of the world's longest-lived company.

What in essence was Masakazu Kongō's fatal strategic blunder ? The last of the Kongō's considered Kongō Gumi primarily a construction company, which in reality it has never been. What it had been, for over 1400 years, was a niche temple construction company using highly sophisticated, proprietary wood sculpting and building techniques, handed down from one generation to the next. In its small-pond niche market Kongō Gumi was big fish. However, the big lake which Kongō Gumi was aspiring to thrive in, was infested with much bigger fish preying on small fry.

Facing secular challenges, what could the last of the Kongō's have done to save the company? Instead of opting for unrelated diversification, the company could have developed new markets in which their skills and knowledge were relevant, such as the production of religious shrines, the construction of sophisticated secular wooden buildings, such as public museums, or the construction of high-end, traditional residential buildings. Instead, by entering the mass-market construction business, Masakazu Kongō, violated one of the very principles of the Kongō dynasty: 'Don't diversify' (into unrelated activities).

Despite its rather inglorious end, Kongō Gumi's exceptional longevity over fourteen centuries was all the same remarkable - are there any lessons which might be applicable to businesses in general, and particularly family businesses ?

In order to answer this question, we need to understand the reasons for the company's rise to a leading constructor of Buddhist temples. The company's specific competitive advantages were rooted in its core competencies of high value-add wood craftsmanship. Its competitive moat was dug with the help of the sophistication of the required skill levels: it took a Kongō master builder over ten years to train an apprentice - quite a formidable barrier to entry for any would-be imitator. To maintain its leading edge, Kongō Gumi needed to uphold the highest level of quality in its craftsmanship: "Customers know what to expect. If our level of quality goes down, we become a common company – we don't distinguish ourselves."[xxvii] Unfortunately, the last of the Kongōs did not heed his own advice when Kongō Gumi diversified into the general construction business.

Having established the causes of Kongō Gumi's demise, which were the main reasons for their impressive history of survival ? As alluded to before, succession, or the governance principles applied to succession in family businesses, is one of the key empirical reasons for family business failure. If succession is based on the principle of primogeniture[xxviii], the oldest, but possibly mediocre or (worse) lazy son gets handed the opportunity to put an end to a business dynasty. So how did successful succession look at Kongō Gumi ? Successful succession meant that Grandma got the 'top job' if she happened to be the most competent among the members of the Kongō clan[xxix]. Competence, not male primogeniture, motivated family decisions about succession. Succession and success were closely interrelated in the company history.

Another success factor was related to the company's unique level of craftsmanship and quality. Sadly the company's demise had to do with failing to recognize its core purpose, its core competency and the competitive advantage derived from it. In this sense, the demise of Kongō Gumi exemplifies the vital importance of understanding what a specific business is all about. In the words of Jim Collins, "…it is better to understand *who you are* than where you are going – for where you are going will almost certainly change"[xxx]. In other words, a company's core purpose is "…more important (than core values) for guiding and inspiring an organization"[xxxi].

Corporate longevity is invariably correlated with craftsmanship and the production of high added-value products: speedboats, church bells, sophisticated glass objects, gourmet food based on proprietary recipes. A long-lived FMCG company is almost a contradiction in itself, as the lack of differentiation combined with pointless innovation of the type of four-blade razors[xxxii], battery-powered peppermills or electronic exercise belts are recipes for corporate irrelevance. Craftsmanship as a key differentiator, on the other hand, conveys a sense of pride and meaning for a company's employees reaching beyond earning a living.

Creating Meaning from Innovation

Executives like to proclaim that their employees represent their 'most valuable asset': success and long-term survival depends on the skills and sustained motivation of staff. When companies fall on hard times, those who have a purpose beyond profitability and are able to keep morale high are more likely to survive than those whose employees struggle to find meaning in times of cost-cuttings, lay-offs and pay cuts[xxxiii]. Keeping the corporate non-financial purpose alive in times of change is critical. Developing corporate *logotherapy* may be more material to long-term survival than debt-financed stock buy-backs in an attempt to boost earnings artificially.

This stated, it is not difficult for management to instill a sense of purpose in the employees of a pharmaceutical company working on the development of vaccines to fight rare diseases, a fuel cell manufacturer or even a provider of leading enterprise software solutions. But what about the employees of, say, a toilet paper manufacturer – can they ever find any sense of pride, purpose and belonging in their work ?

Peter Lorange relates the story of Paulo Pereira da Silva, one of his former students. In 1984, EPFL-graduate Da Silva took over the family business Renova, a Portuguese manufacturer of toilet paper and other disposable tissues. Appointed CEO in 1995, he challenges competitors in a global market dominated by multinationals such as Procter & Gamble or Kimberly-Clark. Renova at that point had "…no clear cost advantage, no distinctive brand positioning and no unique product features."[xxxiv] Following a restructuring of the company, Da Silva repositioned the business from a maker of disposable paper products to a *provider and guardian of personal health and well-being*. Obviously, the products and the brand had to reflect this new ambition: Renova introduced toilet paper and tissues impregnated with moisturizing lotions to the Spanish, Portuguese and French markets. In the wake of this commercial success, Da Silva launched the first black toilet paper, followed by fuchsia, orange and royal blue, all stylishly packaged. Da Silva's 'purple cow' strategy[xxxv] transformed Renova from a producer of commodity products into a successful "…highly value-add niche player that has successfully sidestepped the dominant multinationals in a low-margin, commodity-driven market.[xxxvi]" Few would argue that the company had increased the odds of its survival over the long-term, and instilled a new sense of purpose in its employees.

Corporate Anti-Ageing: Five Recommendations to Ensure Longevity

Many factors contribute to long-term corporate survival, and some are specific to either family businesses or widely-held public corporations. The following five basic principles, if applied consistently, are likely to increase the life span of businesses irrespective of their legal forms:

1. Provide purpose and meaning. The quality and duration of human lives depend to a large extent on the presence of meaning, and much less on external factors such as material wealth[xxxvii]. In a similar fashion, the correlation between corporate longevity of businesses and the purpose and meaning they provide to their employees is much stronger than the impact a certain rate of profitability has on the life of a company. Companies must know 'who they are' and what their purpose is, and how they can elevate their corporate purpose to the highest possible levels, e.g. through innovation. Company executives who know '*who we are'* and '*what our purpose is'* have a higher probability of making the right strategic choices about '*where we should go*' in order to remain relevant and survive over the long term. Kongō Gumi's last CEO had the wrong answer to the first two notions and the company consequently took the exit to extinction, Renova on the other redefined their purpose, gave itself a new meaning and signing a new lease of life for the company.
2. Design governance in a way to minimize the agency problem. Appoint a CEO who has a strong self-interest in the longevity of the company, and who will, along with other shareholders, bear the financial consequences of mistakes, and not merely participate in the upside; design executive compensation in ways to have CEO's contribute 'skin' to the game, not just receive stock options. Family businesses, including private banks, managed to minimize, if not eliminate, the agency problem. The biggest of their public counterparts, aiming at earnings growth at all price, are continuously mired in scandals, none of which will cause any financial harm to their executives whose personal worst-case scenario consists of being handed a golden parachute.
3. Balance innovation, informed risk-taking and financial prudence. Minimizing the agency problem through maximizing 'skin in the game' will already go a long way in ensuring a business is managed with a view of the survival of the business over the long term, instead of short-term, bonus-triggering financial performance. Although evidence suggests that family

businesses are generally better able to minimize agency problems, they may in some cases limit their development potential by refraining too much from taking risks. Numerous examples of reckless risk-taking by managers in search of growth and personal financial gratification (most recently exemplified by the Volkswagen emission test fraud) and their inevitable effect on corporate survival show that erring on the side of too little risk-taking is the better long-term strategic choice. Financial prudence, such as exemplified in the Shell study, is the 'Keynesian' equivalent of building reserves in good times in order to survive, and gain market shares at the expense of less prudent competitors in tougher times. The current wave of leveraged stock buy-backs by US corporations in order to grow earnings on a per-share basis, hence triggering executive bonuses, flies in the face of financial prudence and will come at the expense of longevity as more and more corporations unable to pay back loans in an environment of normalizing interest rates will go bankrupt.

4. Base succession on competence. Don't give any consideration to gender in succession planning, don't think in categories of male or female leaders: think in terms of leaders. Consciously or unconsciously giving preference to less qualified, but male candidates to succession jeopardizes corporate survival.[xxxviii] Succession planning should be one of utmost concern to every company, corporations or private businesses alike. Boards of corporations, being able to select leaders from both inside and outside candidates for once have an edge over family businesses who often limit themselves to choosing the best from a small group of family members. Kongō Gumi managed to create success from succession by making CEO positions available for more qualified in-laws irrespective of their gender.

5. Establish frugality as a core company value[xxxix]. Kongō Gumi's leaders refrained from displaying any external signs of power and status. The size and furniture of their offices were hardly recognizable from those in the accounting department. Andy Grove, co-founder and former CEO of Intel imposed frugality as a core company value by setting the example every day: his executive suite consisted of a standard 3x3 m cubicle (albeit a corner cubicle overlooking Santa Clara), he insisted on travelling in economy class and took local trains from the airport, much to the horror of Intel's security staff. Needless to mention, under Grove's reign the biggest and most profitable semiconductor company did not own a single corporate aircraft, while Hewlett Packard, under Carly Fiorina already in decline, owned 12 large corporate jets. The principle of frugality applies to any kind of resources, including but not limited to corporate financial resources. Frugality is a state of mind, encompassing self-constraint, discipline and strictly objectives-based spending in good times and bad, but also a dose of healthy paranoia, a constant mindfulness of the ephemerality of corporate existence.

[i] Cf. e.g. Carol Kennedy, 50 and still nifty ; in : The Director, 1997 or Ellen de Rooji, A brief desk research study into the average life expectancy of companies, Stratix Consulting Group, Amsterdam, 1996

[ii] Kim Gittleson, Can a company live forever ? in : BBC News, New York, Jan 19, 2012

[iii] Economist, Dec 16, 2004 : The business of survival

[iv] Corporate Strategy jargon for competitive advantage protected from competition

[v] Napa Valley wineries have begun de-alcoholizing some of their premuim wines as rising alcohol levels have affected quality

[vi] Except for the longest connections, e.g. Marseille – Brest ; The advent of low-cost carriers undercutting the TGV railway tariffs has since partly reversed this process

[vii] Diversification (Investor Peter Lynch speaks of 'diworsification'), contrary to the 1960s to 1980s, is nowadays considered a handicap : stockmarkets apply a substantial 'conglomerate discount' to diversified companies (cf. e.g. The Economist, August 15, 2015, pg. 60)

[viii] The brand name 'Shell' was derived from the use of seashells as means of payment

[ix] The Study is kept in the non-public archives of the company. Arie de Geus, one of the two planners, published a book on the study : Arie de Geus, 1997, The Living Company, Harvard Business School Press, Boston

[x] Arie de Geus, pg. 6,7

[xi] In the context of this article, a 'family-owned business' or 'family business' is understood to be a private company majority-owned by a single family.

[xii] The problem of devising corporate governance in ways as to minimize the divergence between the (long-term survival - and growth-oriented) interests of shareholders and the (short-term, profit-oriented) interests of hired executives.

[xiii] Nassim Taleb, 2012, Antifragile, Random House, pg.404-405

[xiv] Cf. e.g. Nassim Taleb

[xv] Excessive risk management may, however, have the problematic effect of stifling innovation : "Corporate governance is in many ways poison to the creative and innovation processes within a company and it is easy to get to the point where the board is more preoccupied with risk management (…) than building the top line. (Peter Lorange, Jimmi Rembiszewski, 2014, From Great to Gone – why FMCG companies are losing the race for customers, Gower Publishing, Farnham, UK, pg.5

[xvi] Nordqvist, Mattias (ed.) and Zellweger, Thomas (ed.), 2010, Transgenerational Entrepreneurship: Exploring Growth and Performance in Family Firms Across Generations, Edward Elgar Publishing, Cheltenham, pg. 168

[xvii] Rupert Merson, 2010, Rules are not enough – the art of governance in the real world, Profile Books, London, pg. 8

[xviii] O'Hara, William T, 2004, Centuries of success – lessons from the world's most enduring family businesses, Adams Media, Avon, Mass.,pg. XX

[xix] O'Hara, pg. xviii

[xx] Peter F. Drucker, 1995, Managing in a Time of Great Change, Butterworth-Heinemann, London, pg. 50

[xxi] Nordqvist, Mattias (ed.) and Zellweger, Thomas (ed.), 2010, Transgenerational Entrepreneurship: Exploring Growth and Performance in Family Firms Across Generations, Edward Elgar Publishing, Cheltenham, UK, pg. 169

[xxii] Buddhism, having originated during the sixth century B.C. in India became popular in China and Korea and introduced to Japan around 540 A.D.

[xxiii] Gumi means 'Group'

[xxiv] O'Hara, pg. 12

[xxv] Including regarding the company's culture: Masakazu Kingo's grandfather committed suicide at the age of 35 during the recession of the 1930, having been forced to cut jobs
[xxvi] O'Hara pg. 12
[xxvii] O'Hara, pg.10
[xxviii] The eldest son is first in line to take over from the father
[xxix] For a cultural analysis of succession in Japanese family businesses, cf. Hamabata, Matthews Masayuki, Crested Kimono, 1991 : Power and Love in the Japanese Business Family, Cornell University Press, Ithaca
[xxx] Jim Collins, Jeremy Porras, 2004, Built to Last, Harper Collins, pg. XXV
[xxxi] Collins, Porras, pg. 224
[xxxii] e.g. four-blade razor 'Fusion ProGlide with FlexBall Technology', recently followed by a five-blade version
[xxxiii] In an analogous manner, psychiatrists working in prisoner-of-war camps found that "only those who were oriented toward a future, toward a goal in the future, toward a meaning to fulfill in the future, were likely to survive.“ (Victor E. Frankl, Man's search for ultimate meaning, Perseus Books, Reading, Mass, 1997, pg. 135
[xxxiv] pg 39
[xxxv] cf. Seth Godin, 2009, Purple Cow : Transform your business by being remarkable, Penguin Books, New York
[xxxvi] Lorange, pg. 41
[xxxvii] cf. the lifework of Victor E. Frankl and the ''Third Viennese School of Psychotherapy'
[xxxviii] cf Sheryl Sandberg, 2013, Leaning In : Women, Work and the Will to Lead, Random House, New York
[xxxix] for the link between caloric restriction in humans and lifespan cf. www.ncbi.nlm.nih.gov/pmc/articles/PMC1480571/ retrieved September 14, 2105