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## Cryonics suspension - debating life finitude, extending time capital and cancelling death

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### **Abstract**

*The study discusses the anti-death movement inside the life extension paradigm and its social implications in terms of enhanced permeability of life-death boundaries, by reconciling mysticism, theology, technology and scientific innovation. It analyses current debates, the transmission of polemic information over extreme life extension by cryogenic suspension through vernacular knowledge. Ethical, scientific, financial and spiritual controversies come into consideration, as pro and counter-arguments emerge from ongoing debates investigated by netnography of themed blogs and forums. Digital platforms facilitate in-depth access to beliefs and attitudes expressed in relationship to continuity of stream of consciousness across the projected post-self project. The study calls for the questioning of agency and performativity in the context of transcending time dynamics and achieving biological and chronological time suspension. Solutions for extending longevity are explored in terms of critical reflection as to providers' market, financial impact (e.g. creation of new niche products such as afterlife insurance to cover expenses of cryogenic suspension or fundraising for cryo-preserving young persons who died tragically) and relocating the burden of proof in arguing whether human cryonics is potentially viable in the future. It brings a new perspective on the traceability and sustainability of time capital (Preda, 2013), while discussing the impact of the belief that death is ultimately curable and avoidable, by future medical progress and overall scientific and technological advancement.*

### **Keywords**

*Anti-death movement, post-self project, time capital*

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## **Introduction**

The topic of cryonics approached from a time sociology perspective is insightful and intriguing, as it has been so far under-theorized and under-conceptualized. Cryonics promises an extension of one's time capital or lifespan, a psychological asset that is conceived as the only clear convertible capital or total time budget available that is spent from death onwards (Preda, 2013). The prevailing argument that cryonics advocates express is that death is pronounced only because medical progress is not yet so advanced as to make more types of illness curable. Hence, to maintain their chances of prolonging life, cryonic patients need to be preserved and wait until future medical technology will find the necessary cure (Shoffstall, 2010). Cryonics is deemed as advanced critical care, carried out on a multi-generational term of decades or even centuries (Moen, 2015).

Scientific advancement in neural cryobiology, embryo and tissue banking methods are provided as basis for cryo-preservation (Hoffman, 2007). The aim of cryonics procedure is to preserve the whole body, with special focus on the brain, as intact as possible, stabilized and stored for practically unlimited time spans. In terms of technical procedure, once legal death is pronounced, blood circulation is artificially restored to avoid clots, then cryonics patients are gradually cooled down and water inside cells is replaced with a cryo-protective substance (by a vitrification process similar to the production of glass) to block chemical reactions leading to decay (Alcor Foundation, 2016). The vitrification solution prevents the occurrence of tissue fractures that happen when intra-cellular water expands during freezing, which causes chemical bonds to be destroyed. Cryonics proponents equate this cryo-preservation process with stopping biological time, also coined suspended animation, and claim that cells do not need to operate constantly to remain alive (Bailey, 2014). However, critics argue that life is not suspended, but annihilated, when energy transfers with the environment cease (Barbaro, 2011).

Studying the cryonics online community means giving voice to atypical, marginal, somewhat radical sub-cultural minorities who act as evocative illustration of "little mass", transitory group or "post-modern tribe" (Rokka, 2010), a micro-social world that functions as advisor, trader of meaning or provider of intelligibility to its members.

The study intends to achieve the following objectives:

- To portray how membership to cryonics community is socially shaped and reconfigured using discursive argumentation practices
- To examine the dialectic means by which debates emerge and controversies are either solved or reignited on blogs regarding the birth of a new would-be science
- To discuss the anti-death movement inside the cryonics belief system and its social implications, in terms of vernacular understanding of cryonics

Research questions ensue:

- How do cryonics and the concept of digitalized post-self bring about a new perspective on the traceability and sustainability of individual time capital?
- How are agency and performativity imagined, questioned and re-enacted in the context of life extensionists' beliefs and transcendent time?
- What are the values, assumptions and attitudes that cryonics enthusiasts cherish, and how are these online traces transmitted and incorporated in the digital fabric of debates?

## Theoretical perspectives

### *Representations on post-self and transcendent time*

Cryonics triggers ontological debate not only on forums, but also across scientific discourse. The option for cryopreservation is associated with an attitude of fear towards death and negatively correlated with the spiritual or religious belief in the existence of an afterlife (Lohmeier et al., 2015). Conversely, opting for cryonics can be considered as rational choice for people who believe in the future of nanomedicine and technology, and who think death is the irrevocable, irreversible terminal point, because even minutest chances of recovery are rationally deemed as better than none (Moen, 2015; Farman, 2013). In a critical vein, other authors relate cryonics to time cosmologies involved across the designed practices and discourses symptomatic for neoliberal capitalism and anxieties about time and future (Tiffany, 2010) or to non-reflexive acceptance of and coping with technology as aim in itself and not merely as means to a higher end (Bernstein, 2015).

The major counter-argument to cryonics establishment as scientific practice is that reversibility of vitrification has not been demonstrated scientifically until present for more than body parts of mammals (a re-transplanted viable rabbit liver is the most vitrification experts achieved so far). However, according to cryonicists' optimistic outlook, fully reversible neuro-preservation of human brain is demonstrably feasible within our lifespan (Sutton, 2015). Worldwide, there are several thousand members of cryo-preservation associations and several hundred cryo-preserved patients.

The process of constructing legitimacy for what is thought to be a revolutionary, breakthrough new science of cryonics is complex and highly debatable even 50 years after its formal launching. Its supporters strive to de-construct the widespread idea that cryonics is impossible by comparing it to other lines of thought, previously considered preposterous, now well-established, such as the discovery of electricity, television, aviation, space travel or computer technology. The process of previously ostracized sciences becoming legitimized and institutionalized highlights the blurred, fuzzy boundary between creative innovation and sheer madness: *"It always seems unimaginable and a folly, until it's done"* (Tennison, 2012, 407).

In the attempt to legitimize cryonics as scientific pursuit, providers such as Alcor and Cryonics Institute publicize an open letter of support based on epistemic authority exerted by influential experts in fields relevant for cryonics such as neuroscience,

nanomedicine, computing, cryobiology, ethics or theology, and their prestigious institutional affiliation to Cambridge, Harvard, NASA and MIT. These scientists claim that there is “a credible possibility” (Alcor Foundation, 2016) that effective hypo-thermic cryo-preservation performed today can manage to save enough neurological data so as to be reversed in the future to allow biological tissue restoration and continuation of life. The best preservation conditions refer mainly to the shortest possible delay between clinical death and the beginning of ultra-low temperature cryo-suspension procedures.

Life extension and life enhancement innovation are sensitive to echo in rich vernacular interpretations that form symbolic icons and contingent images or metaphoric representations integrated within belief systems that are subjectively invested with credibility, salience, plausibility and legitimacy (Wagner, 2007, Nowotny, 1993). Vernacular cognition refers to informal, non-specialized and context-specific knowledge that is investigated through a sub-type of discourse analysis technique called narrative inquiry (Goldstein, 2015; Bartel, 2014; Wagner, 2007). It is contingent and local in the sense that it reflects tribal assumptions, socio-ecological connections, networks of significance and influences symbolically traded in the life extensionists’ community. Representations on transcendent future interpret the post-mortem period from a religious or laic viewpoint as succession of events that follow biological demise (Boyd & Zimbardo, 1997).

Self-identity refers to the conceptualization and assessment of self in its distinctive features, abilities, moral values and attitudes that articulate the self-definition of who an individual genuinely is (Cheng & Chu, 2014). These self-directed beliefs have both conscious and unconscious dimensions and include, besides uniquely self-directed characteristics, other socially meaningful markers such as self-defined social roles, socio-economic status and other demographic traits. Self-identity acts as predictor for behavioral practices such as health-oriented choices, by the transposition of life philosophies into action: “Identity is a conscious or intuitive sense of sameness over time” (Horowitz, 2012, p.3). Self-perception and self-image form self-concept representations built on schematization, modelling, generalization of past behavior and psychodynamic prediction.

This socially distributed knowledge flows through informal networks, such as blogs and forums examined in the current study, is crowdsourced and co-created (Brem & Bilgram, 2013) by various stakeholders (users, consumers, opinion leaders) and reveals the public taste for uptake of science through quasi-scientific (sometimes pseudo-scientific) means. Hence, it can be assumed that everyday thinking and laypeople reflexivity incorporate and diffuse knowledge on cryo-preservation and its implications in ways that are collectively striking and personally relevant, as well as non-standard and particular for various groups involved in tackling cryonics across blogs and forums. As in the case of social representations on nuclear research (Courvoisier et al., 2013), the topic of cryonics is presumably prone to polemical information, and potentially more memorable due to debates and controversies ignited by poignant ethical or technical-procedural aspects that anchor expert terminology and trigger focalization mechanisms favorable to the assimilation of relevant data.

Apart from anxiety-ridden uncertainties, cryonics embraces also a longer-term time perspective, confident about technological advance, by means of self-projection in the future and the Faustian belief (or Promethean hubris, according to Sutton, 2015) that anything is possible, in an endeavor to live it all, have it all, own it all, indefinitely. Cryonic suspension is interesting also in terms of ways that secular institutions represent the connection between life, body, death and personhood, and they proliferate such cognition onto social actors (Farman, 2013).

Scientifically deferring death by fighting against aging and disease nourish the objective of extended longevity which cryonics proposes, as extreme case of regenerative biomedicine (Lafontaine, 2009). Would-be resurrectionists are warned that proof-of-concept for suppressing or sojourning biological time limitations is still projected onto a conceivably distant future, and cryonics is only legitimate in speculative terms, still awaiting the first reanimated cryopreserved patient (Hoffman, 2007).

### ***Anti-death movement and “You only live twice”***

Supporters of cryonics view the brain as the most amazingly complex construct in the whole Universe. They argue that, as far as the headquarters of our identity and personality – the brain - remains quintessentially intact, the body can be regrown through expected advancements in nanotechnology and molecular biology (More, 1996; Tennison, 2012). They consider the body as mere accessory that houses the brain, a carcass or “package” that can be rejuvenated or recreated altogether through bio-engineering, regenerative medicine available by genetic advancement (e.g. in DNA sequencing) and extended use of 3D bio-printers. Cryonics research is currently involved in devising and testing new cryo-protectants and improved vitrification procedures that reduce the risks of fracturing and dehydration, as well as replicating the three-stage process (preservation, storage, revival) for biological specimens (so far successful on insects and eels) to maximize the prospect of reversible biostasis in humans (Urban, 2016; Moen, 2015).

Suspended animation at ultra-low temperatures means molecule movement comes to a standstill and all chemical activity in the body comes to a halt. Biological time is stopped and living is put on hold. While viewing the after-life dynamics of the dying process as life suspension, technology meets transcendental future beliefs that claim death is avoidable, curable and survivable through access to afterlife (Seema *et al.*, 2014). The epistemic implications of cryonic suspension refer to death as process rather than a dichotomy between life and death. Hence, the relationship between life and death is better conceptualized through the metaphor of a dimmer, more so than an on-off switch (Alcor Foundation, 2016; Barbaro, 2011). Permeability of life-death threshold is the last remaining parenthesis, the only mystery left unsolved and the last piece of puzzle that can be helped to fall into place by future medical progress and overall scientific and technological advancement. The philosophical presumption on which cryonics rests infers that death is morally wrong, it represents an undeserved punishment and should be avoided at all costs (Tennison, 2012).

The cryonics movement as extreme life extension doctrine are acknowledged to have begun in 1962, when the scientist Robert Ettinger, published his book, "The Prospect of Immortality" (1962, *apud* Bernstein, 2015). The life extensionist philosophical outlook that forms the conceptual framework for cryo-preservation envisions life as retrievable and death as reversible. It claims that the boundary between life and death is thin, permeable and fluid, and that all is not lost until information is erased beyond recognition. Cryo-preservation is considered by its supporters as lifespan put on hold, as suspension of time passage with possibility to un-do or un-freeze one's personal time capital at a later date, when regeneration and rejuvenation solutions will be accessible (Bailey, 2014).

There are two types of life extension outlook. Hence, digital life extensionists that support consciousness transfer onto a robotic extension of self defend their thesis by appealing to quantum theory, which demonstrates the principle of indistinguishability for identical particles (Bailey, 2014). These "indiscernible particles" can be used to redesign an entire organism from new atoms cloned from original ones, and the theory further states that the two entities are undistinguishable from one another. However, anti-cryonics postings reveal a salient discrepancy between the clone and the original being, which rests on access to previous experience and consciousness deposited in the memory storage. Restoring post-revival access to conscious experience and memories, to fight against collapse and entropy, and ensure continuity of personhood, would be a challenge for all cryonics attempts. Whereas cognitive components of information processing and memory have already been emulated to an advanced level by computer intelligence and artificial intelligence, emotional, motivational and volitional elements are seemingly more challenging to replicate. Biological life extensionists claim the whole organism of a cryo-preserved patient can be revived when medicine has developed sufficiently as to heal the impairments that caused the initial death. Life extensionists feel it is their role to drive away the „fiction" out of this „science fiction" scenario of a distant, yet foreseeable socially constructed reality (Shoffstall, 2010).

The common explanatory framework for both digital and biological, mainstream and fringe life extension conceptions claims that the extension of personal time capital (conceived as total duration of existence or lifespan by Preda, 2013) constitutes the most valuable improvement and the essential objective of practice-oriented research, and that ageing and death can and must be defeated. Their creed is to fight against finality and fatality, by aiming to transcend human constraints and make death preventable and curable (Sutton, 2015). By and large, cryonics redefines what it means to be alive, the nature of identity, the duality of body (material) and spirit (as intangible component made of brain and stream of consciousness) (Bailey, 2014; Sutton, 2015).

Cryonics backers argue that between life and death there is a continuum of intermediary states that do not have a default binary "on-off" nature as most people are used to think. Death as a process means that it is gradually destroying the order of deployment at cellular and molecular level, however, up to a still indeterminate point of no return, this process is reversible. As per Alcor Foundation (2016), "calling someone 'dead' is merely medicine's way of excusing itself from resuscitation problems it cannot fix

today. This makes people feel better about abandoning the patient and making the unwarranted assumption that nobody could ever fix the problem”.

Ethical concerns that most cryonics specialists (including representatives of provider associations) acknowledge refer to cryopreservation as speculative, optimistic projection, because it relies on two undemonstrated reversibility conjectures: one of cell damage generated by what we today call “dying” and the other, by the cryo-preservation process itself (Farman, 2013; Hendricks, 2015). From a theological perspective, exponents of cryonics envision no conflict between their doctrine and religion, because both outlooks are bridged by pro-life beliefs and life-affirming principles, by the common value they add to life and continuation of liveness as extensively as possible.

### **Research methodology**

As the study dwells on time-related values, norms and attitudes developed by actual and potential customers of cryonic suspension, it requires a methodological approach that is non-invasive, immersive in the world of expectations and innermost beliefs held by its subjects, discrete yet sensitive enough to capture and unravel aspects that influence diverging perspectives on cryonics, transcendent temporality and post-self reiteration. Such aspects that netnography can help excavate and reveal by a naturalistic approach to online interactions (Kozinets, 2002) include immanent rationality, as well as emotional logic, social contextualization and motivational idiosyncrasies, taken-for-granted thinking and embedded subtleties that underpin the decision to invest resources in debating over cryonics. The discussion includes debate shareholders such as: opponents, contesters, proof-of-concept supporters, would-be and actual customers of cryonics services.

Accessible, straightforward and expedient, netnographic approaches are beneficial because they reconcile two seemingly contrasting sets of features, namely: open and flexible towards evoked meaning, as well as robust and rigorous across data collection, data identification and interpretation phase (Kozinets, 2002). Two other research perks that are apparently contradictory, but harmonized by netnography, refer to traceability of digitally stored data trails by archiving, which adds up to data reliability and greater applicability also for longitudinal studies, and, on the other hand, decontextualisation, because opinions expressed by online contributors remain, by and large, un-connected to social identity cues (Xun & Reynolds, 2010).

The over-abundant volume of data can deter validly focused interpretations (Weijo et al., 2014), hence the stringent need for selecting only the most relevant topics and thematic categories for analysis and sticking strategically to the research plan to avoid any detours that would be challenging to integrate within the body of research. In the attempt to capture authenticity in co-creation of meaning, netnography can help reconcile focus with data dispersion, breadth with depth as it is essentially an unobtrusive, flexible multi-method toolkit that lends well to innovative research venues, building on many approaches for data collection and interpretive analysis (inductive, deductive, intensive and extensive, longitudinal or cross-sectional), as well as multiple research topics, as diverse as performing extreme sports, retro-brands, consumer

boycotts, ecological citizenship, Nintendo buyers or Lego fans, online gastronomy blogs or crowd funding projects (Rokka, 2010). Because of the fast-paced rhythm of online cultural production, netnography as eminently open-ended practice implies significant limitations due to the short-lived validity, transience, contingent evanescence and built-in obsolescence of its findings, however insightful they currently are (Rokka, 2010; Kozinets, 2006; Weijs et al., 2014).

Qualitative thematic analysis of readers' comments on cryonic preservation includes a total amount of 367 postings on public-access blogs and user groups within 17 discussion threads. Inclusion criteria for each thread are: over 200 views, over 50 individual contributors (message posters) and over 20 inter-member interactions (measured by listed separate discussion threads) relevant for the research questions, in the reference period March – August 2016. Trends and patterns that surfaced during the exchange of polemic information regard: diversity of perspectives, presence of divergence, controversy and debate, multi-vocal participation, descriptiveness, contextualization by storytelling and narrative framing. Data sourcing is performed on original content (i.e. commenters' input) using the following blogs and forums: Chronopause, Less Wrong, Wait but Why, Alcor Foundation blog, Gizmodo.

All 367 postings were inserted into a text editing file and processed via NVivo QSR software that simplifies core operations (data mining, coding, making connections) performed on research units. In terms of data analysis, the procedure consisted of an inductive thematic analysis, bottom-up, data-driven approach. Following the first stage of code assignment to textual cues, comments were rechecked, to make sure no topic or thematic unit of analysis has been omitted. The second stage involved cancelling duplicate codes and merging equivalent codes. In the third stage of data analysis, following the inductive process, stand-alone descriptive codes were inter-correlated and computed into higher-level explanatory categories by means of abstractization and generalization.

Online communities are seen as no less important or “real” than physical communities, because of the increasing rate of spending screen time in the virtual environment of webpages, newsletters, chat rooms, forums, blogs, newsgroups and other online formats used to propagate and enhance the exchange of crowdsourced ideas. Identified analytical themes are: ethical considerations, spiritual aspects, vernacular cognition, philosophic implications, juridical precautions, experiential approach to time. Relevance for the topics of cryonics and transcending time form the main inclusion criteria for the purposive sampling of these postings threads used for netnographic analysis. Diverging opinions were key to thread selection because they minimized the impact of lop-sided over-representation of for or against arguments. By their expressed opinions, informants and users are valued as resource integrators, co-generators of value and a web of meaning, defined as discursive practice focused on a figurative repertoire of nuanced significances that are traded, shared, symbolically reconfigured throughout the argumentative and persuasive communication process (Daj, 2012).

Original comments as online textual artefacts were not provided by their authors for research purpose. Hence, the suspicion of psychological prejudice caused by



unintended use, virtual “eavesdropping” or prying and taking advantage of commenters’ unsuspecting remarks. As ethical precautions taken to avoid ethical invalidation of results and poisoning of the research well for future studies (Kozinets, 1999), forum moderators were approached and provided acceptance and informed consent as per the research objectives and *modus operandi*. Research was performed only on publicly available forums and blogs, where authors agreed beforehand to terms and conditions involved in disclosing opinions by publicly available comments on life span extension.

The netnographer obeyed confidentiality and anonymity requirements by not disclosing informants’ online identity (user names, avatars or nicknames) or physical one, and reviewers’ comments presented as research findings were randomly recoded using pseudonyms. Privacy breeches were avoided by these supplementary precaution measures, despite some authors’ claims that the responsibility for data usage rests uniquely on informants themselves, who freely chose for their posts to be public, by agreeing (though sometimes without due diligence) to the terms and conditions of such forums (Firat & Dholakia, 2006, Frankel & Siang, 1999, cited by Xun & Reynolds, 2010).

Netnographic analysis powered by computer-mediated communication is conceptualized as “translocal site of the social” (Rokka, 2010, 382), an e-community of ideas or virtual, transitory and *ad hoc* meeting place of people concerned with the same topic. These post-modern tribes are fluid, fragmented and have overlapping membership. The interpretive approach of netnography devises a re-sensification insight about formal messages being reshaped, contested, recast and given new meaning that is intelligible and relevant to e-community members. Profiling the sub-culture of cryogenic debaters concerns a marginal group considered also as deviant, radical-minded or transcending current norms, conventions and areas of preoccupations.

Hence, netnography of cryogenic voices dwells the realm of ambivalence, dissonance, doubt, concern, opposition and contestation, all depicted on a canvas of cultural bricolage, blurred delineation and intertextuality (Firat & Dholakia, 2006; Rokka, 2010). The empirically-oriented approach allows for the in-depth study of the dynamics of cultural production for life prolongation means related to cryonic suspension.

## **Result analysis**

### ***Membership profile and neotribal identity***

Analyzed discussions reveal the long-term time orientation necessary regarding life insurance for cryonics. Similar to retirement savings, it needs to be purchased while still young, to be affordable. Legislative regulations that introduce restrictions on cryonics reflect public controversies surrounding such procedures. Peri-mortuary practices related to cryopreservation are forbidden in some countries and regions, including Canada, country that neighbors most cryonics providers (Urban, 2016).

The consumer profile of cryonics customers (both individual members and whole families who signed up also their small children) includes a variety of backgrounds, ranging from more predictable professional venues (such as writers of science fiction

novels) to other more mainstream ones – physicians and other health professionals, attorneys, computer engineers, film producers, psychologists, philosophers, economists, business consultants, chief executive officers - CEOs, entrepreneurs, artists and pilots (Alcor Foundation, 2016).

For covering the costs of revival sometime in the distant future, cryonics providers rely on the assets created through the patient care trust and stimulate co-membership through social networks from a longitudinal perspective. Hence, the emphasis remains on shared interests and intra-community bonding, inter-generational support and mutual aid, as friends and relatives who have loved ones in cryopreservation would be motivated to revive them, and revived patients, once reintegrated socially, will further seek to restore the life of other members. Patients' social rehabilitation can also mean a unique chance of extending one's time capital so far as to become friends with distant descendants. The sense of affiliation and belonging is reinforced through both transversal solidarity (with current members) and promised longitudinal affiliation (with descendants). Networking for continuity means that live members act as "sponsors" (also enrolled for cryo preservation) or tutors and advisors on behalf of deanimated patients (Alcor Foundation, 2016).

Reanimation of cryopreserved patients in a new, unfamiliar environment, in a distant time span of hundreds of years later, means devising also reinsertion shock-absorbers, such as restoring the person in a familiar, comfortable position. To this aim, personal possessions, time mementoes and also pets are cryopreserved and financial solutions are explored in order to keep a personal inheritance for cryonics patients (Shoffstall, 2010; Barbaro, 2011). Financial solutions have adapted to this new niche of services. As such, apart from purchasing afterlife insurance, so as not to wake up dismally poor in the world of tomorrow, beneficiaries of cryonics can establish an irrevocable asset preservation trust with the help of a financial consultant, estate planner or attorney for regaining access to a part of their goods upon revival (Alcor Foundation, 2016).

The taxes paid for cryonics providers include a revival incentive or success fee whose portion in the total paid amount is up to the customer to decide, under certain conditions (Urban, 2016). Decision-making under risk is involved in this deliberation, since a higher than average revival incentive can stimulate earlier revival, but also bring about riskier, cutting-edge procedures that are potentially premature, whereas a smaller success fee is the more cautious, conservative alternative oriented towards extensive long-term care with the possible disadvantage of delayed revival. Cryonics suppliers build the representation of a less uncertain welfare future by explaining the financial, as well as the social safety net – preservation fund and sense of togetherness and community belonging. Additionally, companionship can be revived by cryo-preserving patients' pets. Personal belongings can also be stored in a memory box, kept permanently in a salt mine and returned upon their owner's revival. Such memory enhancers that cryo-patients usually store are journals, photo albums, DVDs, books (Alcor Foundation, 2016).

To dissipate doubts as to the improbability of revival, life extensionists argue that the falling price of new technologies, including nanomedicine and 3D printing, will further increase chances of repair and revival. Contemporaries were born too early to benefit

from such advancement, still they can wait for successors to innovate, by procuring more time capital available by revolutionary treatment in the anticipated future. For the industry of cryonics, business development prospects are still timid, the take-up rate is low; however, it is hoped that recruiting new members and customers will grow exponentially once a breakthrough medical achievement such as the world's first full-body transplant occurs (Sandomir, 2005). Literature documents cases of consumers switching between different providers of cryogenic suspension (four American, Alcor, Cryonics Institute, American Cryonics Society and CryoCare and one Russian - KrioRus) in search of better offers and perceived service improvement (Weaver, 2010; Moen, 2015). Their performance is measured by relevant scientific research being funded and carried out into cryoprotectants, deanimation, biostasis and reanimation processes.

When pondering over offers and options, customers show interest in cryonics provider's history, as predictor of business sustainability: the longer tradition, the better, because institutional longevity is of the essence in this line of business that works with multi-century time horizons (Lohmeier et al., 2015). The same authors explain statistics that show a third of clients are female by several hypothetical assumptions that remain to be proven: women can access self-perpetuation by alternative, more conventional means (offspring, material and / or spiritual heritage) which are more significant for women than men, men can be considered more anxious towards death, more committed to living, more curious and optimistic about the future. Some members belong to religious groups such as the Society for Universal Immortalism and Society for Venturism. These represent eclectic transhumanist doctrines that incorporate theology and ethical philosophy in the pursuit for human immortality, deemed of utmost significance within a system of beliefs that does not imply a supernatural agency or deity (Sutton, 2015; Tennison, 2012).

### ***Coordinates of vernacular rationality directed for cryonics***

How much extended time capital can social actors purchase by cryonics? Even the strongest supporters of cryonics claim that it cannot produce immortality or limitless time capital, as any physical object, including the human organism, is gradually destroyed by the outcomes of time passage. The impact of time passage on personality and self-identity is conceived as prototype of existential transience: "*Physically and psychologically, we are a slightly different person each day that we wake up*". (Less Wrong weblog, 2015). This immanent perishability is used as argument by both supporters and detractors of cryonics: the former claim this flexibility can be capitalized upon to facilitate suspended (re)animation through what is construed as time discontinuation. Meanwhile, the latter state that the entire organism is vulnerable to irreversible decay and the effects of time passage are stronger than any human intervention incumbent of cryonics.

In support of the 'dimmer' metaphor (Alcor Foundation, 2016), life extensionists consider fuzzy boundaries of personal identity, manifest even if the stream of consciousness is interrupted, during a coma, or heart attack followed by resuscitation, or even during the ordinary subconscious world of dreams revealed by time-off during sleep. They attack opponents' view of consistency of personality, discussing experiential

examples to support the idea that humans are not the same from one day to the other, they adapt to new circumstances by learning and doing, by agency and performativity. Pro-cryonics vernacular knowledge envisions the limitations inherent to chasing what cryonicists deem a mystified delusion of consistency and persistency in time, each cell at its place, since neuro-plasticity supports the vision of the leaner, learning organism, perpetually striving for an improved version of oneself.

For those who question the validity of the cryonics pursuit, vernacular interpretations are built about the revival procedure relying on rehabilitation provided by science advancing optimistically and exponentially, by qualitative leaps (or breakthroughs), not mere quantitative, cumulative steps. However imprecise and imperfect, life extensionists share a view on reanimation after cryonic suspension as ultimate coping mechanism based on adaptability, redundancy and neuro-plasticity. The self-healing capacity of the brain to activate back-up mechanisms, restore damaged functions and re-route broken neural circuits is put to the ultimate test when resuming life after biostasis: *“The ability of us to keep being ourselves in the face of changes in our nervous system is pretty amazing.”* (Chronopause weblog, 2016).

As indicated by examined debates, various futurist scenarios coexist in the conceptual realm of curing death. One option for extreme life extension would concern the cryopreserved brain as software transplanted to a surrogate hardware, a fortunately saved back up storing post-self identity. This identity and consciousness transfer, transcending biological matter, is due to be uploaded to a robot to pursue living through a digitalized post-self, within the framework of a virtual reality devoid of biological substrate. Other option would be to develop a cloned body, grown from its owner’s DNA and preserve only the head to ensure the continuity of identity hosted by the memory and cognition functions. The third option would also concern preserving only the head with the brain inside, to be transplanted onto the full body of a brain-dead donor.

The concept that becomes less speculative and more credible as the first medical procedure on humans is scheduled for 2017, coordinated by an Italian neuro-surgeon, after “proof-of-concept” experiments on a dog and a monkey indicated relatively encouraging results (Brodwin, 2016). Critics argue, however, that such intervention is hazardous at least and would require several decades of medical and technological progress to be performed under less risky circumstances. They bring up the resurfaced myth of Frankenstein, by intertwining cryonics with a jigsaw imitation of life bearing the threat of monstrosity. However improbable, the controversy surrounding the feasibility and ethics of such procedure stirs public opinion and creates rating that all news agencies worldwide hastened to take advantage of.

Another concern that elicits debaters’ interest in this controversy is potential or highly likely brain damage during time-extensive cryo-preservation, or whether the synapse-level, neuro-energetic balance in the brain is not too fragile to resist vitrification and reversion of death by curing the morbidity cause that led to it. This topic spurs debate, as pro-cryonicists use the “better than nothing” argument in constructing their adhesion for such practice: they claim that, should even the slightest or remotest possibility remain for pursuing life, those with a will to keep on living would choose

cryonics at least as last-resort solution, as logical and rational thing to do, following a tradeoff decision model similar to Pascal's wager. As per one blogger's viewpoint, "If you knew your plane was to crash and you had to choose between dying instantaneously or trying out an experimental parachute with a better than zero chance of staying alive, what would you choose?" (Urban, 2016); or, in research terms: "Would I rather be in the control group, or the experimental group?" (Hoffman, 2007, 51).

### ***Vernacular rationality directed against fundraising donation for cryonics***

Debaters who opt against fundraising adopt four types of counter-arguments:

- Revival is unfeasible
- Revival will become feasible sometimes, in the distant future, but the cultural shock will make cryonic patients' life unbearable
- Notwithstanding technical or social challenges, those in charge with revival expect tradeoffs which are hard to provide on a large scale, lest accomplished by an ancestor-worshipping cult: a single resurrection as one-time event would be sensational, then, after a series of successful procedures, interest would fade off
- Extending one's life span through cryonics is unnatural, selfish, and immoral given the scarcity of resources and the ecological footprint of expected overpopulation

For the last argument, pro-cryonics commenters claim life extension through cryonics is fundamentally – in its logical rationale - not different from other more conventional longevity boosters such as antibiotics, vaccinations, organ transplants or chemotherapy. Hence, in principle, life extensionists are not more egotistic than beneficiaries of other forms of medical treatment that hinder naturally occurring death and hence contribute to accelerated resource depletion. According to the same forum contributors, the macro-scale solution to ensure a sustainable future for cryonics survivors would rest on a self-regulatory mechanism, by which societies become more affluent and long-lived, and population takes care of itself, lowering medical costs and redirecting them to prevention. The argument leads to the idea that cryonics and other more conventional options of life prolongation would compensate decreasing natality typical for developed societies whose welfare system preserves the pro-life philosophy.

Pro-cryonics debaters regard the connectome (the totality of synapses) as infrastructure of personhood and consciousness. Detractors of cryonics claim the dynamics of a living brain cannot be inferred from its molecular and synaptic neuroanatomy (Hendricks, 2015), as cerebral structure is not enough to emulate or simulate its functioning. The counter-argument by which several detractors reject the idea of cryonics is that precarious preservation makes the connectome irretrievable notwithstanding progressing science (Hendricks, 2015). Empirical evidence quotes as proof of precariousness that impedes on cryonics success the homogeneous approach based on a reductionist, one-size-fits-all model of preserving the entire body or the entire brain under uniform conditions. Standardized cryoprotectants or antifreeze vitrifiers

provide identical treatment in terms of substance concentration, mixture, to support long-term biostasis, whereas each functional area of the brain has different needs.

The whole approach is accused of reductionism as existence (either digitalized as post-self 2.0 or physical) is equated with identity and distinctiveness supplied by the brain alone: “What I find off-putting about this idea is not whether the science is realistic or whether it's emotionally natural to want to put off death. It is that believing in cryogenics requires such a mechanical idea of what a <person> is” (comment, C.I., in: Dvorsky, 2013); “We are not our brain. We are our total somatic and emotional experience.... The error of thinking otherwise is common among programmers, who often think of people as imperfect computers” (comment, A.N., in: Harmon, 2015).

Another foreseeable impediment would be the risk of bankruptcy of cryonics providers that prompts the question of organizational longevity needed to support biological (or cerebral) one. Not only economic reasons are given, but also contingency clauses that are more likely to appear on the long term: natural disasters accelerated by climate change, wars or terrorism. Cryonics detractors put forward not only the impossibility of reanimation after extensive suspended animation, but also its implausibility, by questioning the rationale of future persons to revive more than a few museum specimens of “People with really unpopular ideas and ancient narrowmindedness and ancient bigotries - or a lack of the proper, current, future-time bigotries that are considered right and true. ... a drain on resources, useless, bothersome old people from the past...” (comment, V.I., in: Less Wrong, 2015).

In this anti-utopian vision, reanimated cryo-patients anchored into the past would lead a solipsist quasi-existence (either physical or solely digital), feeling alienated, uprooted and lonely. After the first wave of sympathy stirred by revivals, skeptics argue that bestsellers and blockbusters that tell time travelers' story begin to wear off in obsolescence and redundancy, also creating a burden on welfare and health systems of the future.

### ***Dialectics of argumentative vernacular logics, contradiction, polemics and debate shaping the opponents' profile***

Polemic information exchanged on cryonics seems to exert widespread curiosity, and sometimes fascination, as one active poster stated that “this stuff was so weird, so outlandish, so unbelievable, and it's like, I wanted to know more. I got addicted to it” (Less Wrong, 2015). Most disagreement stems from the possibility of being revived, not from the choice of opting in or out of cryonics. Diverging opinions are extrapolated to a mutually derogatory view of otherness. Life extensionists accuse their opponents of being overly analytical (hair-splitters), pessimistic and short-sighted, and, in turn, promoters of cryonics are considered naive, irrational and gullible. The war between cryonics enthusiasts and opponents is waged using metaphors (such as: hibernation, zombie, Frankenstein, clone, teleportation in time, mimetics, playing God, vat-brains) as symbolic missiles set to blow up the other's thesis.

Detractors of cryonics claim their opponents rest their persuasion attempt on a misrepresentation or intended confusion between theoretical possibility and feasibility: *“It is this purposeful conflation of what is theoretically conceivable with what is ever practically possible that exploits people’s vulnerability”* (comment, B.Z., in: Chronopause, 2016). Skeptics claim the procedure will remain infeasible on the long run because it is not priority research and experimental proof is missing for this highly unlikely - non-zero chance: *“All they have is: <You can’t prove it can’t be done>”* (comment, S.C., in: Urban, 2016).

Critics contest cryo-advocates’ futurist outlook as over-optimistic by rendering examples of difficulties that experts encounter even when trying to retrieve data from 30-year-old computers. Mapping a single connectome would take up half of the world’s current information processing and storage capacity (Harmon, 2015). Its scanning is limited so far to sesame-seed size for this intricate structure is considered the repository of memory and learnt behavior and the potential preserver of self-awareness and self-identity.

The cryonicists’ argument of feasibility for the cryo-preservation procedure and especially for its reversibility rests on the idea that hypothermia is reversible under a few hours of cardiac arrest. In turn, opponents argue that it is preposterous to compare this case with biostasis or induced suspended animation of human life for decades, through immersion and storage in tanks full of liquid nitrogen, at  $-120^{\circ}\text{C}$ , until a cure for the cause of death is discovered. Moreover, cryopreserved cells, simple tissue or embryos cannot be equated with infinitely more complex and longer-term procedures concerning the brain or the whole body. Consequently, detractors view cryonics providers as shabby business owners selling false hopes to naive consumers. Opponents refer to life retrieval after cryopreservation using the metaphor of putting together a document after it has been through the paper shredder – conceivably possible, but with highly disputable results.

Another question raised by skeptics, provided the best-case scenario does function and cryopreserved patients wake up, centuries later, concerns quality of life awaits for them, since prospects of livability on Earth are dimming with anti-utopian landscapes projected by natural resource depletion, global warming and extreme climate change including desertification, terrorist threats and mass destruction warfare, extinction of plant and animal species and overall deterioration of living conditions. Vernacular knowledge about plausibility and probability of revival is highly sensitive to news of current or soon-to-come medical progress (e.g. Brodwin, 2016) and to prognosis on tomorrow’s social and economic prospects. In the same vein, environmentalists are chief cryonics opponents, whose arguments targeting improbability of revival state: *“It is more likely to bring back an extinct species, dinosaurs or the woolly mammoth, not a parasite, over-populating species like Homo sapiens”* (comment, M.J., in: Urban, 2016).

In defense of their version of tomorrow’s reality, cryo-enthusiasts express hedonist arguments for the joy of embracing life, counting one’s blessings and witnessing what the future has in store: *“I really like life. I like doing things and thinking things and I like my family and friends and want to keep hanging out with them if I can. I also really want*

to see what happens” (comment, I.J., Chronopause, 2016). Cryonics partisans consider with anguish the prospect of ending consciousness into traceless nothingness, with irretrievable thoughts, emotions and memories. They fear this end would cast a shadow of meaninglessness onto their whole existence. Conversely, their detractors consider this anxiety about existential finitude - represented across lay narratives – as middle-age crisis, a stereotype people can relate to by an emotional reaction – pity, shame, sense of ridiculousness: *Opting for cryonics is sort of like the extreme version of men’s middle-age crisis, go buying a red corvette and get a new girlfriend half your age* (comment, I.B., in: *Less Wrong*, 2015).

The desire to extend sensification through a presumptive (even if unlikely) post-self brings them comfort and consolation to deal with the prospect of dying. Despite its remote (as per proponents) or quasi-null (as per critics) probability of success, cryonics is deemed a worthwhile investment at a middle-class affordable price in a developed country, when comparing expanding life duration with other more conventional coveted goods: *“if it only costs twice as much as an X-Box live subscription and it might (with varying degrees of hopefulness - I’m at the high end) procure my immortality, worst case scenario it’s money well wasted”* (comment, N.E., Chronopause, 2016).

#### ***Fundraising for cryo-preservation: crowdsourced debates***

One theme that still spurs significant controversy concerns a fundraising campaign for cryonic suspension of a neurosurgery graduate student, Kim Suozzi, who died at 23 of a malign tumor (Harmon, 2015; Dvorsky, 2013). Kim’s original post was “upvoted” on the blog (ranking akin to “liking” on Facebook) 89 percent of the time, stating her dying wish: she wanted to become cryopreserved and needed the help of donors, fellow cryo-sympathizers, to pursue a posthumous existence. The supporters’ profile ranged from individuals (of which Google software engineers made up a significant portion), to high-tech, fringe organizations such as: genetics start-up research companies, organ banking and providers of cryonic services and related partners such as producers of cryo-protectants. The case study illustrates the social significance of consolation or alleviating injustice provoked by someone young and intellectually skilled dying. The propensity to help is supposedly bolstered by the affiliative connection between Kim’s career choice (neurosurgery) and the nature of technological and medical progress required to make the cryogenic procedure effective.

Postings against this fundraising campaign argue for the procedure being disturbing, invasive and useless: *“Let her rest in peace and do the best you can to preserve her memory, not her body”* (Harmon, 2015). Although socially legitimate as dying wish, critical postings deem Kim’s appeal for fundraising as arbitrary, whimsical, idiosyncratic and rationally absurd: *<That could just have easily been “take a bath in 1000 liters of yogurt” or “meet every person with the name Dave” — way to focus on the wrong part>* (comment, C.B., in: Dvorsky, 2013). They propose alternative ways to spend crowdsourced funding with more impact, instead of accomplishing what they perceive as selfish act with extremely low probability of success: *“This is reported like it’s some sort of*



*admirable achievement whereas donating the raised money for a more practical cause would have been a noble thing to do. All I see here is narcissism. Oh, and she's dead. In a very expensive coffin"* (comment, E.S., in: Dvorsky, 2013).

A recurring argument perceives cryonics as a selfish self-conservation act, when money could be used far better for charitable purpose. The invoked counter-argument is that purchasing any good or service, not merely cryonics, is driven by self-interest and ultimately involves an egocentric interest that fuels mutually beneficial social exchange: *"Those asking such questions should begin by giving up their late model car, their cable TV, and their cappuccino for the benefit of the underprivileged of the world before asking others to give up their life!"* (Alcor Foundation, 2016).

### **Discussion, conclusions, implications for argumentative rationality**

Cryonics reflexivity and argumentation often resorts to untangling ethical challenges by an attempt to stop classification and social labelling processes that lead to exclusion. For example, they claim that all persons should be entitled to a second chance of life regardless of age, because their lives are equally valuable, from a medical standpoint. Moreover, confidence in the future of technology and medicine means that today's elderly can be reconsidered as tomorrow's middle-aged, with life prolongation mechanisms becoming more accessible and widespread.

The cryonics community constitutes a venture ground of contrasts: small, easier to investigate monographically as it is united within a common goal. Endowed with core ideological identity, it yet expresses polarized views that combine rationality with relationality, performativity with emotion and visceral reactions triggered by this radical outlook on life prolongation. Studying cryonics helps gain insight to questions about the social normative construction of acceptability or avoidability of death. How much resistance, opposition or hostility to it do our cultural norms allow us to exhibit? Analyzed opinions are increasingly less prone to accept its inevitability, even under the direst circumstances, more attached to life and living, perhaps also because of more intensive use of time, less boredom, more meaningful pastimes to take up. From inappatence to death, to intolerance and outright rejection of the concept, together with the ambition to abolish disease and aging, cryonics displays polemic information useful for sensification purpose.

The conducted netnographic analysis points out to the conclusion that cryonicists' online community is a type of transactional neo-tribal reality bound by a framework of affinity and mediated interaction that transmits shared meanings, common beliefs, expectations and aspirations. Across this effervescent environment, the vitality and intensity of members' involvement often generates controversies and ignites debates.

The need for extended agency and performativity, for perpetuating the meaning of self can be analyzed through the lens of a neoliberal, individualistic cultural background where everything is possible, even a second life that a self-determined, resolute, resilient and ambitious individual would be entitled to: *"Letting go would mean giving up before it's over, and death as we know it today is not the end, not actually. Humble*

*acceptance of death, as morally prescribed by religion, would mean you accept your lack of consequence, you are so unimportant and irrelevant for humankind” (comment, A.L., Chronopause, 2016).*

Hence, cryonics is assimilated to an insurance against defeatism and despair, as its customers buy not only a gamble or a lottery, but also a back-up plan functioning psychologically as source of emotional comfort meant to relieve pressure at the challenging prospect of dying. In the passage (illustrated by cryo-patients’ suspended animation phase) from selfhood to post-selfhood, temporality appears disassembled and recomposed to shape an integrative continuum. In this vein, being caught up in the process of becoming can be interpreted as commodifying transcendent time whilst appropriating the future.

Empirical findings testify as to the heterogeneity of expressed opinions that boil down to a dicing ambivalence: the choice for cryonics is considered either heroic (the courage to go to great risk to struggle for one’s life compared with cancer survivors), or as inability to accept death as inevitable part of life. Embarking on the improbable undertaking of life prolongation transcends the boundaries of a thought experiment to challenge widely held assumptions and recast rationality involved in attempting the seemingly impossible. Netnography as textual observation technique reveals significances commodified and socially traded as part of the immersive online communication experience conceptualized as “language game” (Wittgenstein, 1968, *apud* Kozinets, 1999)

The digitalized post-self can be conceived as ultimate case of outsourcing, or reassigning the task of living onto an external entity. As social actors outsource almost everything, from business services, to household, childcare, the task of handling identity and organizing one’s personal time capital can be leased to a post-self provider of digital liveliness that handles all psychological functions on an integrated platform or playground for imagination, cognition, memory, storing and processing of information.

Blogosphere content dedicated to cryonics concerns much more than the mere transaction of commercial information. It dwells on a multi-fold perspective on cryonics, by exploring financial, spiritual, ethical, medical, technological, scientific venues relevant for the topic. The analysis renders a hybrid field of meaning, symbolic realm of multiplicity, eclectic bricolage and fragmentation of a blurred, multi-vocal, multi-stream discourse wherein everybody seems to be talking with anybody and nobody in particular. The interpretive framework of netnography depicts a broad, versatile, yet thick and in-depth description of the cryonics community seen as a micro-social world in itself, through a monographic lens that strives to capture even the subtlest of nuances. This versatility, the diverse writing styles and superposition of various perspectives renders netnography provocative as moving target whose only constant trait is change itself.

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