

The Death of Cryonics: Factors Related to Its Poor Uptake

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ABSTRACT

Cryonics is a technique for freezing dead bodies at very low temperatures in the hope they will be revived at some time in the future when medical technology becomes available. At present, there are no known revival methods; however, the role of innovation in medical practice leads certain individuals to hypothesize that death will be reversible in the future. While cryonics might resonate with certain questionable contemporary Western cultural themes of death denial and neoliberalism its uptake remains minuscule. Several reasons may be pertinent. First cryonics does not fit with existing western cultural views of death and medicine. Second, poor marketing, prohibitive cost, and the lack of involvement with the funerary industry may be significant factors impacting poor intake. Third, the cryonics discourse around ideas of 'death' constructs a barrier that prevents 'outsiders' from relating to the task of cryonicists. Fourth, the general public may have a poor understanding of this technology. Finally, there may be religious objections and cultural reductions due to the lack of ritual and thus no possibility of memorializing the dead, which impacts the human appeal of cryonics.

Keywords: Cryonics, Death, Denial, Ritual, Information.

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I. INTRODUCTION

In this paper, we reflect upon the lack of uptake of cryonics. While other 'immortalist' technologies have been proposed that aim to extend life, including mind uploading (uploading the contents of one's brain onto a computer through scanning and recreating the mind through computer simulation), and gene therapy (preventing aging by manipulating genes to stop their decay), these will not be further discussed here.

Cryonics is defined as "a technology for freezing a person after a terminal illness, or a fatal accident, in the hope that medical science will be able to revive the person in the future when life extension and anti-aging has become reality" (Alcor Life Extension Foundation, 1993, p.5). It is a 'scientific' approach to immortality or, at least, to a greatly increased lifespan. There are five known providers for cryonics, Alcor, the Cryonics Institute and Oregon Cryonics all based in the US; KrioRus is located in Moscow and Southern Cryonics bases their systems in Australia. Cryonics is totally dependent upon future technology which is not available at present but may be developed in the future. In this instance, it is nanotechnology-computer-driven tiny machines. No matter what kills us, cryonics speculates, future medicine will be able to reverse this.

Cryonics is described as a life-extension strategy, like biomedicine, in that it aims to preserve and extend the human lifespan. However, in contrast to biomedicine, it is dependent upon technologies that do not exist in present. Techniques that might be developed in the future include rejuvenation, cures for various mental and physical disorders, and the repair of cells at the molecular level. Though cryonicists see cryopreservation as a medical procedure, in western society it qualifies legally as a form of disposal of a dead body- ie undertaking. Its practitioners contend that they can intervene in the process of death in the window between the stoppage of the heart and the death of the brain. The individual is placed in a cold 'storage' and metaphorically is suspended between life and death.

A. Practical Aspects of Cryonics

In 1962, Robert Ettinger in his *Prospect of Immortality* (Bostram, 2005) described the ethical and practical aspects of cryogenic preservation. An introvert and intellectual by nature, he lacked expertise in finance, enterprise and engineering and the lack of detailed forethought may have sown the seeds of the failure of the movement. The movement attracted a significant number of followers and subsequently became known as Cryonics. Three years later the first person was cryogenically suspended with many soon

following. However subsequently many cryogenic organizations became bankrupt, leaving their facilities abandoned. This resulted in the thawing of several preserved bodies.

Cryonics is premised on the idea that human and animal tissues can be preserved at extremely low temperatures when chemical reactions and tissue-degrading metabolic events no longer occur. Clients remain alive during this crucial period before brain death occurs. After the body cooled on a bed of dried ice, it is dehydrated, then cryoprotectants are subsequently pumped through the circulatory system. The clients are stored long-term in large cylinders of liquid nitrogen, which are kept at minus 202 degrees centigrade. While this process aims to limit any tissue damage in the body, it cannot eliminate it totally.

The technology depends on the idea that when a person dies from disease or from senescence, a method must be found to repair the cause of death before any revival could be considered. Supporters of the movement argue that nanotechnology – microscopic machines which can repair damage to individual cells - will lead to effective preservation and revival. Alcor contends that cryonics is supported by rigorous scientific methodology, and an open letter supporting this futuristic technology has been signed by world-famous scientists at prestigious institutes like MIT, Harvard University, Nasa, and Cambridge University.

Critics of cryonics assert that cryonics is a pseudoscience (Shermer, 2001). Others such as Romain (2010, p. 194) cryonics as a cultural manifestation of “anxieties about aging, time and the future, more so than any real science”. For her, cryonicists relabel death and view it as an obstacle rather than as an endpoint.

B. Poor Uptake

Given the promise of a future life, the focus of this paper is why the uptake of this technology has been vanishingly small.

The first individual was cryogenically preserved in 1967 and since that time a handful of firms have grown, providing cryonic preservation for the general public. There is evidence, however, that the cryonics industry has only grown slowly over the years. As of 2013, approximately 270 people have been cryogenically preserved since the idea was first raised in 1962 and around 700 to 800 people have committed themselves to cryopreservation once they are declared legally dead. Despite the widespread marketing and media discussions about cryonics, the growth of the cryonic industry has been very poor, and the American lay public has been very slow to accept its practices. According to Kaiser (2014), 270 patients have been cryo-preserved and are existing in a state of ‘cold sleep’. The largest provider Alcor Life Extension Foundation notes 159 patients have been cryopreserved with 1198 people registered for cryopreservation. KrioRus state that they have suspended 63 patients (Swan, 2018). Now 40 years after the cryosuspension of the first individual and significant technical progress, it is notable that enrolment remains vanishingly small. Sodolsky and Halsall (2016) note that the general public does not consider aging a disease, nor do they see death as a medical problem. The general public has been put off the idea of cryonics by the failure to demonstrate any revival from a state of suspension.

In fact, as Stodolsky and Halsall (2016) argue the mainstream view of cryonics is an unusual internment practice. At one time it was officially registered as a cemetery and the general public often sees cryonics as a ‘cult’. A recent YouGov survey (2018) in the UK indicated that only one in eight Britons were willing to be cryogenically frozen. Seven out of ten participants maintained that none of the people who have already been frozen will ever be successfully revived.

While the idea of cryonics is known to many people from widely featured popular cultures like films and video games and in the media, among the general public it remains somewhat an oddity (Koch, 2010; Lohmeir *et al.*, 2015). Cryopreservation is seen as far from mainstream mortuary practices. Studies of attitudes towards cryonics and its sociodemographic correlates are at present sparse. Rieveman (1976), in her study among immortalists, reported that “the average American cryonicist is white, male, highly educated, non-religious, has a mean age of 39.2 and is politically unorthodox; he has a higher income and more fear of death than the average US citizen”(p. ix). Romain (2010) argues for a similar profile of cryonics advocates. While she did not conduct a sociodemographic study her data obtained through individual interviews reflects similar sociodemographic factors and attitudes to society, life, and death as Rieveman’s study. Farmaian (2012) participant observation study reports a similar classical formation of people as Rieveman (1976) and Romain (2010). Badger’s (1998) market research study discusses the potential target population in the USA –potential customers rather than actual users. Those demonstrating some interest include primarily males aged between 35 and 64 years, or younger than 25 years, with above-average education and income.

Finally, Lohmaier *et al.* (2015) deployed a survey method in Germany. One thousand respondents received information about cryonics and then were requested to answer questions relating to (1) socio-demographic characteristics, (2) attitudes towards technical progress and (3) attitudes to spirituality, (4) life and (5) death alongside seven further questions originally deployed by Rieveman (1976). Only a fifth of those interviewed imagined being cryopreserved themselves. Like previous studies, men were significantly more likely to accept cryopreservation than women, and it was younger men who were established in their profession who demonstrated more positive attitudes toward this technology. Interestingly prior knowledge

of cryonics was not related to measures of acceptance. Spiritual factors emerged as significant predictors of attitudes. The study indicated that attitudes towards death – especially those associated with death anxiety – can account for the preference to be cryopreserved after one's death. On the other hand, those who maintained the possibility of an afterlife tended to refuse cryopreservation.

Thus despite varying methodologies, these studies indicate the preponderance of relatively young, well-educated, and affluent males, non-religious and holding above average fear of death.

Below we discuss five pertinent reasons for its small uptake: Its poor fit with cultural views of death and medicine, financial and marketing issues, the language of cryonics, lack of knowledge and finally religious objections and the absence of ritual in cryopreservation.

C. Death Denial, Anxiety and Neoliberalism

Cryonics might reflect two contemporary cultural factors in Western societies: Death denial and neoliberalism and these factors might enhance the uptake of cryonics. Several authors contend that the contemporary American attitude toward death is one of denial (Kellehear, 1984; Zimmermann & Rodin 2004; Swenson, 2010). It could be argued that cryonics is a response to a historical trajectory that has explored how we can overcome death. Death is abhorred; a failure that must be overcome through medicine. It is notable that the dying process is highly medicalized, often hidden from public view in hospitals. Death conversations are often avoided and referred to as morbid.

Zimmerman (2012) argues that the death-denying thesis might be too simplistic. We would concur and argue that death denial is cyclical and that recent world events like mass shootings and domestic terrorism have in fact heightened our awareness of death. As Wong and Tomer (2011) note, the unpredictable threat of terrorist attacks since 9/11 and the constant 24-hour media coverage of both natural and man-made disasters worldwide have in fact heightened our awareness of the threat of death. In a similar way violent video games, TV dramas, and Hollywood movies have made us more aware of our mortality. As these authors state death denial is always doomed to fail because of the ever-present reminders of death and dying. Rather than focus on death denial, we should rather focus on death acceptance in their view.

The death-positive movement in the United States is a social and philosophical movement that promotes open discussion about death, dying, and corpses and is becoming more popular in the USA. It may be seen as a counter-reaction towards this death denial although the authors are not aware of any views they hold directly pertaining to cryonics. We might, however, ask whether cryonics is an extensive form of death denial as Krüger (2010) argues, or does cryonics paradoxically make us face up to our mortality?

Second is the fact that cryonics reflects the mainstream capitalist neoliberal ideology in the USA offering not only an insurance policy against the ultimate loss of one's own life but additionally the possibility of additional material and/or wealth accumulation in the future. Genovese (2018) asserts, building upon Foucaultian notions of biopower, that cryonics is an embodiment of neoliberalism. She states:

The inescapable specter of death, however, has always been unconquerable by capital—no matter how hard one has pulled themselves up by their bootstraps. Cryopreservation is presented as a solution that resolves the American fear of death while feeding into the mythos of neoliberalism: that the individual paired with the free market is an undisputed, powerful cure-all for society's problems (...) Furthermore, cryopreservation infuses neoliberalism directly into the human body; it turns the body into a special type of property that is able to be invested and banked, with a potential return of immortality in the future. (2018, p. 54).

D. Lack of Fit With Contemporary Cultural Views of Death and Medicine

Prisco argues that cryonics challenges many widely held ideas about death and medicine in Western society:

Cryonics overturns the Vitalistic view of life, challenges the conventional definition of death, invalidates the core tenets of contemporary medicine, erodes the need for a mystical afterlife, radically redistributes capital (disrupts inheritance, bequests, and mortuary customs), mandates a complete change in reproductive behavior, perturbs generational succession, requires space colonization, requires (and supports) profoundly disruptive technologies such as cloning, regenerative medicine, nanotechnology, artificial intelligence, and finally, ends the species and enables, if not requires Transhumanism (2010).

Furthermore, for Prisco, the cryonics movement results in a range of adverse intellectual and emotional states like extended indefinite anxiety and uncertainty regarding life threatening illness and the wellbeing of the loved one (where the cryonics patient remains critically ill long-term), it does not permit psychological closure and psychological coping that accompanies 'true death' and results from the deposition of remains, the ritual of the funeral, it disrupts the intimate family dynamics during the process of dying and can divide family members some of whom who may accept or oppose cryopreservation.

Finally, we can never have a completely accurate vision of the future. The movement is highly dependent upon the notion that individuals in the future who have yet to be born will be sympathetic to reviving today's patients from cryopreservation. This is a bet about we cannot possibly know the odds.

E. Poor Marketing, Regulation and Prohibitive Cost

The second consideration pertains to marketing strategies and economic factors, both of which play a part in the low uptake of cryonics. Cryonics suspension of the whole body can cost \$120,000 and of the brain \$50,000. Funding may be a major barrier to its uptake and it is prohibitively expensive for many. Stodolsky and Halsall (2016) make an important point that marketing cryonics has generally targeted millionaires. Badger (1998) also agrees that the rich find that cryonics is an exciting idea. In his study individuals earning more than \$100,000 a year appear to be more favorable towards cryonics. Rievman's (1976) survey concluded members of cryonics society were likely to be white men in their 30s, without religious beliefs, who were politically unconventional, with higher levels of education, fear of death, and greater income than the average US citizen. Even though health insurance can pay for cryonics, many Americans have insufficient coverage for this.

Romain (2010) asserts that those who use cryonics are investing in themselves long term; namely that cryonics is a form of maintaining health or looking after one's life. She notes that the majority of those interested are people working in the computer industry who are now single and do not have children, thus are the sole person for their lineage continuation, often are middle class although not ordinarily wealthy and who have strong fears of death.

Stodolsky and Halsall (2016) point out that one factor responsible for cryonic's poor uptake is that marketing is not directed towards the funeral industry, and thus, such marketing efforts are having negligible or absolutely no effect, or that there is an unmet demand being made apparent and the funeral industry has generally been ignored as a channel for sales. This results from the refusal of the leaders of cryonics organizations to participate in the funeral industry and its association with death. Furthermore, analysis of data from both the Cryonics Institute and Alcor suggests that the number of individuals signing up for cryonics will continue to decline. There is no way of knowing whether or not cryonics organizations will survive into the distant or even near future.

Finally, the AATB has expressed extreme opposition to cryonics and it is almost impossible for any cryonics organization to gain regulatory approval from the AATB. Therefore, the non-governmental non-profit standard-setting institution, the State may indirectly make the practice of cryonics unlawful. In the UK the Human Tissue Authority (HTA) is responsible for the removal, storage, and use of human tissue (including for post-mortem examinations), but at present, it does not provide any guidance on the use of cryonics. However, it has recently been investigating the industry following the case of the 14-year-old girl in 2016 which attained national prominence.

F. Patients, not Corpses

Cryonics defines three distinct types of death— clinical death, legal death, both existing in biomedicine, and, finally, information theoretical death, which is a term specifically deployed in cryonics. 'Information theoretical death' (Freeman, 1996) denotes the point subsequent to which consciousness and individual identity can no longer be restored to a body because of its decay minutes, hours, and days following clinically legally defined death. Critical brain structures must remain intact for patients to be potentially recoverable. The idea of information death receives some support from the scientific community. For example, Whetstine *et al.* (2005) contend that the brain comprises a discrete pattern of atoms, each as effective as the next so long as the unique pattern of their arrangement persists. The attributes of personhood are presumably encoded in this lattice. This theory allows us to view people as 'information beings', as defined by the arrangement of particular atoms that comprise our brains at any moment in time. As long as that pattern of information is recoverable, the person cannot be thought of as dead.

Alcor defines death as an absolute and irreversible loss of life occurring in human beings subsequent to the destruction of their brain structures. At this point death is viewed as no longer reversible. Cryonics is dependent upon the belief that bodies can be frozen before the occurrence of information 'theoretical death'. Death is seen as an obstacle due to limitations in current day medicine rather than a final end point. Cryonicists maintain that no one— be it lay people, doctors, scientists, philosophers or clergy—know at what point it is impossible to retrieve a person from progression toward death.

Death is denied through cryonicist discourse. Romain notes:

The cryonics community has created a specific lexicon that tries to normalize the possibility that death can be 'defeated' and that prefigures a lifetime as spanning the long, long-term. For instance, the entire cryonics community refers to a stored body or head as a 'patient'- again reinforcing the idea of the medicalized aspects of cryonics as a healthcare intervention. Sometimes, these patients' photographs line the walls of a cryonics facility to counteract the medicalization of the body and

remind staff that these are not simply bodies in storage but friends and family members with whom they could be reunited one day in the future (2010, p.198)

Importantly, Alcor cautions its members against the use of the word 'dead'. Wowk (1988) states:

However, I believe something more descriptive is necessary for cryonics purposes. For one thing, it's necessary to adopt a terminology that does not in any way suggest an element of death (and all the emotional and intellectual baggage such an association will invoke) when discussing conditions other than real death. Also, cryonicists need a terminology that will be applicable to conditions far beyond what physicians today would ordinarily consider clinical death (such as biostasis, or protracted ischemia).

There has been an attempt by advocates of cryonics to improve 'accuracy' through the use of specific technical language. However, these terms may negatively impact the marketing process, since these typically technical and insider words may lead to entirely inappropriate associations among the lay public. The language used by cryonicists may appear strange to outsiders-after all how can a dead person be a patient? Cryonics almost becomes a religion. Lowenstein (2012, p. 74) states, "I believe the cryonics movement, with its unified set of beliefs, its particular language, and rituals, its faith in the power and impact of the as-yet unproven, is indeed a religion".

In their attempt to eliminate the notion of death Stodolsky and Halsall note:

The continuing insistence on using language, such as "patient" for those in suspension, is typically seen as inappropriate and even humorous by the average person. This gives many people the excuse needed to dismiss the idea of cryonics without a second thought. Any thought about the benefits vs. the costs of cryonics is inhibited by emotional responses triggered by death-related stimuli. This type of inappropriate language virtually ensures an immediate dismissal of the topic. Provider organizations typically explain why they use the term "patient," but the average person has already dismissed the entire idea before reaching this explanation (2016, p.4)

As with any potential intervention in a clinical context that serves to challenge our conceptualization of the boundaries between living and dying as modern medicine is continuously presenting to us, the recommendation is for good critical analysis of both the concept of cryonics, its technology as well as the cases of those individuals (or their relatives) who want to be examples of a 21st century "death".

G. Lack of Knowledge

People may not be attracted to cryonics because they lack an understanding of the concept underlying it. An internet survey in the USA of 517 respondents measured familiarity and attitudes toward cryonics. The researcher found those asserting superior familiarity did not possess superior knowledge (Badger, 1998). Some of those surveyed expressed extreme misconceptions about cryonics and significant attitudinal differences were found to occur between diverse demographically groups. Badger found that much of the public viewed cryonics as a practice that was unethical and selfish with the potential to steal resources and opportunities from mankind and from those children yet to be born in the future. This perception is exacerbated by the rather derogatory references to the topic of 'cryonics' found on 'cult' and hoax websites. Many scientists have been skeptical of the empirical status of cryonics. For instance, an article in Scientific American (Shermer, 2001) identified cryonics as pseudo-science. A survey conducted in Germany indicated that half of the respondents were familiar with cryonics and of those about half had learned the about subject from television or films (Roche *et al.*, 2010). In this study, significant numbers of respondents maintained that it was undesirable to deploy medical technology for overcoming death and fundamentally rejected a post-mortem continuation of life.

H. Lack of Ritual

Religious factors may play some part in choosing cryonics. Religion was shown to be a significant determinant in choosing cryonics in Badgers (1998) survey. Two independent studies, Cogan *et al.* (2011) and Partridge *et al.* (2009) indicated religious orientation impacted choice of using cryonics. Men overwhelmingly predominate in cryonics possibly because women are likely to be more religious, an important cultural factor. Badger (1998) found men, compared to women were around four times as likely to be atheists. Partridge *et al.* (2009) commented that, "participants for whom religious doctrines and the church are an important source of ethical guidance were more likely to express in principle opposition to life extension research than people who reported having no religious beliefs" (p.70).

In a German study Lohmeier *et al.* (2015) examined the socio- demographic characteristics of people who were positively disposed towards cryogenic preservation. In this study of 1000 subjects, fear of death predicted preference to be cryo -preserved post mortem. Those who maintained a possibility of an afterlife tended to refuse cryo- preservation. Patients who self -identified themselves as religious often express a view that life extension contradicted some aspects of these religious beliefs. Partridge *et al.* (2009, p.72) note how cryonicists themselves assert that it is not a religion but rather "a scientific approach to immortality or to a vastly extended lifespan".

It can be argued on the one hand that cryonics represents a complete denial of death which has come to pervade American culture. On the other hand, cryonics resembles traditional ideas about death in Christianity- dead for some time then resurrected. However, cryonics lacks a moral framework and there is no sense of the last judgment. There may be objections to the way that the body is treated as part of the cryonics process, which is based on religious and ethical grounds. There are religious and ethical problems with cryonics. The main issue is whether the procedure is internment or medicine. Resuscitation may be deemed impossible, accounting the fact the soul is gone and only a deity can resurrect the dead.

From a Christian perspective, cryonics can be viewed in three ways. First, as a form of suspended animation or a coma - cryonics is an extension of already existing medical technologies. This is Alcor's view, an organization that itself has many religious members. Second, it may be seen as a form of resurrection of the dead similar to the way that Jesus raised Lazarus. Third Christians may differentiate the long-term suspended animation of cryonics from a medical coma which exists for a significantly shorter period of time given the prolonged timeframes of cryonics suspensions. Like cryonics, the Christian notion of resurrection entails embodiment, maintenance of personal identity and transformation. CI and Alcor keep the whole body suspended in nitrogen. The body will be restored whole fulfilling the requirement for embodiment.

In cases where there is neuropreservation, some theologians question whether we can be reduced simply to brain information. Theologian John Swinton (2014) asserts that we have bodily memory as well. This is a complex argument involving both personhood and *imago dei*. Embodiment possibilities in the future might include robotics, regenerative technologies, and currently unknown biomedical technologies and through this process, we will be transformed. It may result in new and improved bodies and even the possibility of mind uploading. Cryonics involves the continuation of personal identity; the implication is that personal identity continues once the 'person' is restored. Using the same body and restoring it to health does not give rise to any issues of change in personal identity. But in contrast to Christian resurrection, cryonics is not associated with any judgment. Finally, while Christianity argues that the resurrected body will be free of sin, there is no reason to maintain that the enhanced community of cryonics will be the same.

Followers of cryonics state that there is no tension between cryogenic preservation and religion, particularly with Christianity. There are no direct biblical prohibitions pertaining to cryonics. Rather the Bible provides many examples of individuals with excessively long lifespans. Genesis Chapter 5 discusses six Biblical individuals who were alive for over 900 years. Included here are Adam (930 years), Methuselah (969 years), Noah (950 years). Genesis Chapter 11 mentions four more people who lived till at least 400 years of age. Cryonicists propose that if it can be proven that the advancement of medicine accords with God's will, and if God is concerned with the improvement and extension of life on Earth, then it follows that cryonics is certainly in accord with God's will. Finally, as they argue, the soul of a suspended patient is in an identical condition to the soul of anyone who is comatose, unconscious, or simply asleep.

The maintenance of health is a central tenet of Islam; if cryonics is conceptualized as a health care intervention rather than adjusting the point of death, which under Islamic belief can only be scripted by God, then there could even be an obligation to seek cryonic preservation. The question becomes, then, to what extent is cryonics utilized in the future should the technology permit more than one revival and/or greater medical advances and healthcare systems leading to more significant longevity than is estimated at present-day for the non-cryonics population members. The main problem with cryonics as Krüger (2010) sees it is that it lacks a sense of ritual. He argues that modern American funerary culture emphasizes the public display of the dead body and preservation of the body through embalming or hermetically sealed copper caskets:

The central ritual element of the American funeral –the viewing – demands friends and relatives offer the family their condolences by visiting the funeral home where the usually embalmed corpse is laid out. The dead body cannot be present (or viewed) at the funeral service; there is no burial or other ritual that shows: “This is the end”. These rituals contradict the proper idea of cryonics. After all, there is no place of memory – the storage facilities in Michigan or in Arizona might be a great distance from the mourning family, and the collective vacuum flasks in an industrial workshop are not places where people usually go to visit their loved ones (Krüger, 2010, p. 13)

Other organizations have grown up embalming the dead body in an old Egyptian style with an Egyptian-style sarcophagus. Without the presence of the dead body and the accompanying grave, condolences, flowers, and other funeral objects, relatives and friends cannot memorialize the deceased and there is no memorialization place where the dead can be remembered. Funerals not only mark the fact of death, but they also help the mourners to memorialize them and help with the psychological work of grieving. Cryonics to this extent is incompatible with the American funerary culture which stresses the presence of the dead body. Finally, there is a taboo relating to the dismemberment of the body. To most Americans, as Krüger (2010) argues, cutting the head off the deceased for neuropreservation is abhorrent. The cultural preference is for an intact corpse.

Our society generally associates death and grief with the presence of a physical body. Viewing the body allows mourners to share memories of the deceased, allowing a last glimpse of the body. A service generally follows that culminates in the lowering of the coffin into the ground or cremation when the ashes are given to the survivors. The absence of a body disrupts all these traditions and mourners develop cognitive blockage and cannot grieve properly (Boss, 2004), which clearly indicates and illustrates the need to situate death into a tangible socio-cultural practice; in which case, the site of the body's burial or resting-place signifies an everlasting presence.

II. METHODOLOGY

This paper is a critical review of the literature. We searched psychological databases (PsycINFO, PsycARTICLES and PsycExtra), Social Science databases (Project Muse, SSRN, Sociological Abstracts, AnthroSource and Scopus), and medical databases (MEDLINE) using the keywords: Cryonics; uptake; death; denial; religion; ritual; information. Studies conducted within the past twenty years were included.

III. CONCLUSION

The above has considered the factors responsible for the lack of uptake of cryonics: The discourse surrounding it, religious objections and lack of ritual, and lack of understanding and desire among outsiders. One possible explanation, which has not previously received empirical investigation, is the perspective that individuals see it as a gamble and might prefer to spend their money during this life on friends and families rather than 'squander' it on cryonics, a technology which might or might not be possible only in the future. Thus, begging the question of whether people are more comfortable with short-term certainties rather than gambling on longer-term risks? Cryonics, then, is a gateway for confronting existential inquiries about both living and dying albeit whilst framed within technology-based and medicalized notions of death. Regardless of an individual's decision-making about cryonics, our future discourses about death look set to evolve with the nuances of life—and death—as a suspended event.

To conclude, we rephrase the advent of cryonics into the medico-technological realm of the end of life as the death of cryonics. Unless there are some relational elements that are developed to contextualize the process of cryonics as a viable notion of preserving life and fulfilling a quest for the continuation of living in the future, then cryonics will fail to have any traction as a cultural practice. However, it is not our position to advocate or to be critical of cryonics both as a concept or a practice, but rather to explore and analyze why a possibility that taps into age-old curiosity and desires for immortality has not appealed to wider society. We therefore reflect, then, that cryonics has died a surprising death, and suggests we have a lot more to learn about the way we feel about dying, a topic that remains sensitive and taboo even amid highly technological and medicalized treatments of the end of life.

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