

# “It’s a family affair”: The discursive entanglement of social formations in public and private cord blood banking in Italy

## **Abstract**

The dominant narrative in bioethical and biomedical literature criticises private/family cord blood banking as selling a biomedical service that challenges the system of public banks that is based on voluntary donations and distributing umbilical cord blood (UCB) for medical needs. While the public system is described as embedded in the social relations of reciprocity, solidarity and obligation to the collectivity, private/family banking is accused of being a for-profit commercial market that exploits the emotional vulnerabilities of parents with exaggerated and misleading claims about the clinical uses of UCB. This paper challenges this view by showing that both banking systems are embedded in social relations. It analyses the discourses produced by Italian public and private UCB banks and by healthcare institutions to show how these discourses constitute different social formations and attach diverging meanings of UCB banking and clinical use to the set of responsibilities, values and obligations characterising these formations.

## **1. Introduction**

Umbilical cord blood (UCB) is a rich source of haematopoietic stem cells used as transplants for treating haematological diseases and metabolic disorders. UCB stem cells

can be collected at birth, processed and cryopreserved in biobanks. After the first successful UCB transplantation in 1988 (Gluckman et al., 1989), national public UCB biobanks were established worldwide. These biobanks collect voluntarily donated UCB units that are made available to the international registry of the World Marrow Donor Association (WMDA) so as to enable the search for compatible units in case of need. According to the WMDA (2019), more than 700,000 UCB units are stored by public biobanks and participating registries, and around 35,000 cord blood transplants have been performed to date.

During the 1990s, a competing sector of private or family UCB banks emerged; these banks sell to mothers and parents a service of proprietary conservation of UCB for future autologous or family use. According to a 2015 report by the Parent's Guide to Cord Blood – a non-profit foundation aimed at promoting UCB banking and educating parents about different banking options – 214 private UCB banks, located in 55 countries but operating in 93 countries through more than 200 marketing affiliates, have stored over 4.1 million UCB units through the end of 2014 (Parent's Guide to Cord Blood, 2015).

The conflict between public UCB banks and commercial private/family biobanks has been addressed by bioethical and medical professional bodies (e.g. European Group on Ethics in Science and New Technologies (EGE), 2004; Royal College of Obstetricians and Gynaecologists (RCOG), 2006; American College of Obstetricians and Gynecologists (ACOG) Committee on Obstetric Practice, 2008). The biomedical and bioethical discourse tends to mobilise what has been called a “narrative of opposition” (Hauskeller and Beltrame, 2016a) through which the legitimacy of private/family banking is criticised as clinically useless (RCOG, 2006). According to criticism,

private/family banking is based on exaggerated claims regarding future uses of UCB stem cells in regenerative medicine that exploit the emotional vulnerability of mothers/parents for profit (ACOG Committee on Obstetric Practice, 2008); above all, it undermines public banking and the availability of life-saving tissue for clinical needs (e.g. Institute of Medicine, 2005).

*Analytical framework: From embeddedness to entanglement*

As first noted by Waldby (2006), the biomedical and bioethical discourse about public UCB banking is inspired by Titmuss's notion of the "gift relationship" (Titmuss, 1970). In this theory, the British sociologist defends a system of blood supply for transplantation based on voluntary and unpaid donations as promoting sentiments of solidarity, cohesion and reciprocal obligation. Indeed, the French Comité Consultatif National d'Ethique (CCNE), in a policy document, insists on "giv[ing] priority to the principle of donating to solidarity-based biobanks" because the public biobank "operat[es] as an expression of the community's solidarity" (CCNE, 2012: 24). Similarly, the UK RCOG has highlighted how UCB "is *donated to the community* and the decision to do so by the mother is made in the *best interests of the society* of which she and her child are *members*" (RCOG, 2006: 7, emphasis added). Private UCB banks, however, are accused of "running for profit" (EGE, 2004: 18) and of being a "danger [to] society" as they are "likely to contradict the *principle of solidarity*, without which no society can survive" (CCNE, 2002: 9, emphasis added). Indeed, according to medical ethicists Ecker and Greene (2005: 1283), private banks operate through "exaggerated claims of individual benefits [...] designed to attract business".

As several scholars note, the notion of a gift relationship is still the main reference point in the normative regulation of tissue provision in contemporary biomedicine (e.g. Tutton, 2004; Busby, 2004; Busby et al., 2014). However, from a theoretical point of view, the bioethical and biomedical discourse on UCB banking tends to adopt, in a very simplistic way, what economic sociology and anthropology call the substantivist view of the economy (Schneider, 1974). According to scholars of substantivism, the exchange of goods and services is embedded in social relations only in non-market and pre-modern economic systems, while the market economy substitutes these relations with anonymous and amoral transactions.

In fact, the narrative of opposition in biomedical discourse describes public UCB banking as a form of the redistributive economy that is socially embedded in relationships of mutuality and solidarity, while private/family banking is a socially disembodied form of a market transaction in which the practices, rituals and values underpinning and constituting the social fabric are replaced by the selling of a commercial service – i.e. biobanking – that exploits the emotional vulnerability of parents through misleading advertising. This is an asymmetrical notion of social embeddedness considered overcome by economic sociology, which regards any form of economic behaviour as embedded in social relations (Granovetter, 1985) and structured by social, cultural, political and cognitive factors (Zukin and DiMaggio, 1990).

Science and technology studies (STS) have addressed the case of UCB biobanking by trying to overcome the narrative of opposition developed in bioethical and biomedical literature, deeming it analytically untenable in terms of a sociological analysis (Hauskeller and Beltrame, 2016a). Although STS scholars have considered the two

banking regimes as opposed, they have highlighted how private/family banking is not simply a socially disembodied practice, but also a peculiar form of neoliberal biopolitics in which individuals directly assume the management of their family members' health risks and future illnesses (Waldby, 2006; Brown and Kraft, 2006; Santoro, 2011; Beltrame, 2014; Santoro and Romero-Bachiller, 2017). As Brown and Kraft (2006) enlighteningly illustrate, private/family UCB banking is a way of dealing with kinship ties and family responsibilities.

Drawing on this STS literature, this paper aims to offer a further contribution to the analytical rethinking of the narrative of opposition, through an empirical analysis of the discourse of public and private institutions operating in the field of UCB banking. Following the work of Viviana Zelizer (2017 [1979]) on the development of life insurance schemes, this paper shows how both systems of UCB banking construct their morality and forms of social embeddedness through discourses that constitute peculiar social formations according to their relative values and obligations, and attach specific definitions of UCB banking and clinical application to them. Secondly, this paper builds on the analytical framework developed by Hauskeller and Beltrame (2016a), who, by using the notion of "entanglement", formulated by Michel Callon (1998), have rethought the opposition between the public and the private UCB banking system as the outcome of complex assemblages of entangled practices, technologies, regulations and discourses that may also result in overlaps and hybridizations. In other words, the opposition between the public and the private system is not something given and fixed – as the former is a socially embedded redistributive economy and the latter a disembodied market economy – but constructed by processes of entanglements. Following Hauskeller

and Beltrame (2016a), this paper aims to demonstrate how the discourses deployed in informative materials published on the websites of public UCB banks, official collection sites (i.e. public hospitals) and private UCB banks operating in Italy are important elements in the process of structuring the “frames” (Callon, 1998) through which UCB circulates, either as a public resource in a redistributive economy or as a private biological asset in a market of family health services. Indeed, according to Callon (1998), any good or service can only circulate if framed, and this involves that they are disentangled from certain relations and entangled in other relations that constitute heterogeneous networks made of objects, technologies, standards and protocols, regulations, theories, professional associations and social formations. Even if the notions of entanglement and frames were introduced to account for market exchanges and their calculative agencies (Callon, 1998), they can be used symmetrically to also explain any form of circulation, including gift exchanges (Callon and Law, 2005: 723–724). It is only a question of how frames are structured – by entangling some elements and disentangling others, by creating certain “attachments” to the social worlds of individuals or detaching objects from those worlds (Callon et al., 2002).

The original contribution of this paper is that it is based on a systematic analysis of the informative material made available on the websites of both public UCB banks (and their related collection sites) and private UCB banks for pregnant women and prospective parents. This kind of material has only been partially examined by STS analyses on UCB banking. In particular, while private banks’ online advertising material has been considered by STS scholars (e.g. Brown and Kraft, 2006; Martin et al., 2008), these scholars have relied more on documents issued by medical authorities to study how

public biobanking is framed in bioethical and biomedical discourse. The informative material analysed in this paper is considered not only an important source from which pregnant women and prospective parents can develop their understanding of UCB banking, but also a key element in the process of entanglement that structures the different frames in which the decision about donating or privately preserving UCB takes place. By analysing this material, it is thus possible to explain the production of social embeddedness underpinning the two banking regimes, avoiding also to consider individuals' choices about donating or privately banking as the outcome of a rigid moral dilemma between "good mothering" and "good citizenship" (Porter et al., 2012). Instead, it enables us to study how individual decisions are shaped by how discourses deployed by institutions and organisations in the field of UCB banking mobilise and define social formations, attaching particular uses of UCB to a representation of their social world and thus creating different banking "frames" made of entanglements with biological objects (i.e. UCB stem cells), banking practices, technologies and loyalties, and obligations and responsibilities to different collectives. In other words, it allows us to explore how social embeddedness is produced discursively in banking practices.

## **2. Data and methods**

The analysis presented below is based on a study of the informative material made available on the Internet by public and private UCB banks and hospitals acting as collection sites for UCB donations in Italy. Italy represents an important case study due

to its peculiar features: an extended network of public banks and collection sites, and a legal framework that seeks to hamper private/family banking with little success.

According to the Italian National Blood Service (Centro Nazionale Sangue, CNS), there are 18 public blood banks in Italy connected to 269 collection sites (CNS, 2017: 4). The network of collection sites covers 58% of annual childbirths, with a rate of donation amounting only to 4.4% of those childbirths (ibid.: 16).

The Italian legal framework (Repubblica Italiana, 2009) promotes unrelated allogenic donations (i.e. the donor and the recipient are unrelated individuals). Dedicated autologous collections (the donor and the recipient are the same person) and dedicated allogenic-related collections (the donor and the recipient are family members) are allowed and performed at no cost in public UCB banks. However, such dedicated collection is permitted only in cases where pathologies affecting the newborn or their family members can be treated with UCB stem cell transplantation (ibid.). Personal/family UCB banking outside of these documented cases is forbidden within national territory, as is the establishment of private UCB banks in Italy. The export of UCB for autologous and family uses to private banks located abroad is allowed but hampered: parents deciding to export UCB units have to ask for authorisation from the local health authority, sign a form in which they are dissuaded from private banking, and pay a fee ranging from €200 to €300. Notwithstanding this legal framework, according to the Parent's Guide to Cord Blood (2019), 12 private UCB banks operate in Italy through local agencies and affiliated intermediaries. According to a 2011 report by the Italian Association of Hematopoietic Stem Cell Donors (ADOCES, 2011), the number of affiliated intermediaries operating in Italy was 27 and the number of UCB units exported for private preservation amounted to

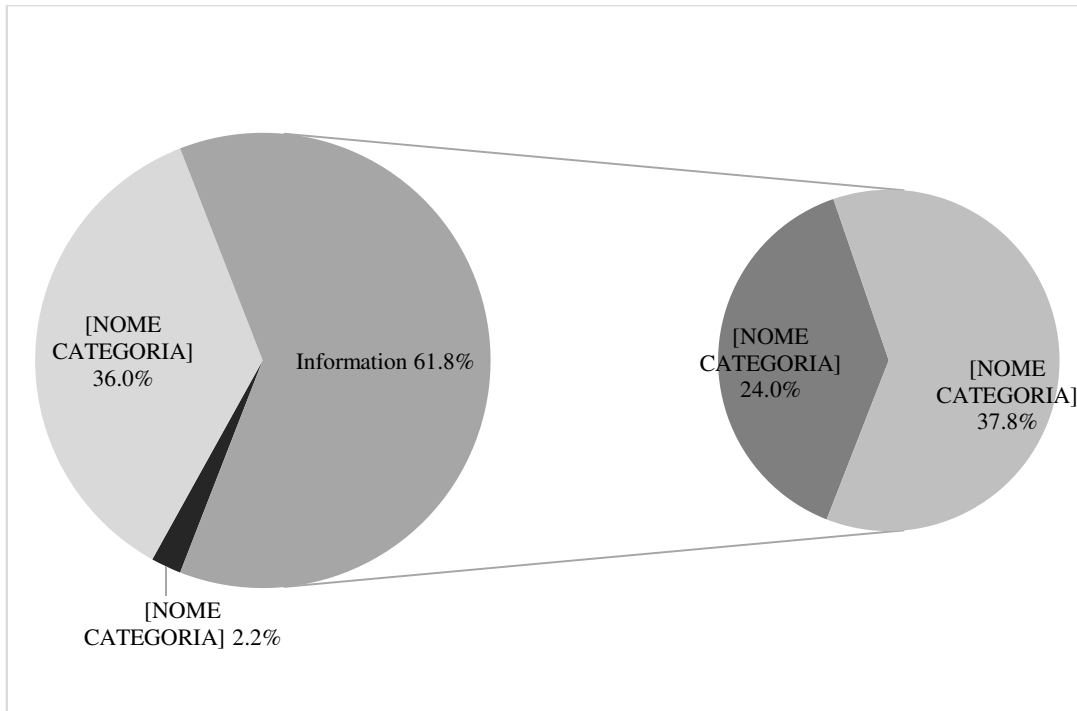


60,000, against the 37,000 units banked through the Italian network of public biobanks at that time (CNS, 2011) and the 45,579 units banked in 2017 (CNS, 2017: 7). Therefore, Italy represents an interesting case for analysing the discursive production of public and private banks. On the one hand, notwithstanding a regulatory framework aimed at hampering private banks, the latter flourish, so public institutions have to work to dissuade prospective mothers and parents to refrain from privately banking UCB. On the other hand, due to the regulatory framework, private banks have to discursively work to legitimize their services and business to attract customers in an institutional setting that is hostile.

The informative material analysed in this paper has been retrieved from the websites of CNS (for the public sector) and the Parent's Guide to Cord Blood (for the private sector). CNS (2019) reported a full list of regional public UCB banks with their associated collection sites (usually public hospitals). From this list, a database of 325 websites – 18 UCB banks and 307 hospitals that act as collection sites – has been created, and each website was searched for information on UCB donations. As shown in Figure 1, 36% of these healthcare institutions do not mention UCB donations. Among the 62% that do mention it, 24% simply inform citizens that donation is possible according to their organisation's structure, while 37.8% offer explanations regarding UCB donations and collections and provide supplementary information in the form of downloadable documents. This research analysed those webpages that offer explanations and attached informative material; it excluded webpages that simply mention the possibility of donating cord blood. The duplicate materials were removed – indeed, several hospitals have uploaded the same explanatory document prepared by the Italian Bone Marrow

Donor Registry or by the Italian Ministry of Health – and a corpus of 186 documents and webpages were saved as PDF files. These were then analysed.

Figure 1. Percentages of the webpages of Italian public UCB banks and collection sites providing information about UCB donations and collections, and the kind of information provided (N=325)



With regard to private/family UCB banks in Italy, the search started from the website of the Parent's Guide to Cord Blood (2019) and the 12 mentioned biobanks' websites were accessed in total. All the webpages have been saved as PDF files, creating a corpus of 229 documents to be analysed. With regard to these 12 private banks: 7 are foreign biobanks operating in Italy through local offices that manage procedures for the collection and shipment of UCB units; 2 present themselves as independent Italian biobanks but, due to Italian regulations, they in fact send their UCB units abroad to

another private UCB bank that acts as their banking facility; 3 are foreign private banks but since they operate in the Republic of San Marino (within Italian national territory) or in the Canton of Ticino, Switzerland (close to the Italian border), they don't need local offices or affiliated organisations in Italy; finally, 1 is an organisation located in Switzerland operating as an intermediary for a private German UCB bank.

This corpus of 415 documents (186 for the public sector and 229 for the private market) has been analysed using the software *Atlas.ti* to code relevant parts of the texts. I adopted a particular approach to critical discourse analysis (Fairclough, 1995) by looking at how the discourse is constituted of social identities, social relations, and systems of knowledge and belief (Fairclough, 1992) while avoiding the function of language in (re)producing power relations, dominance, ideology, and hegemony within discursive practices. In fact, the analysis tends to reconstruct how the practice of donating versus privately banking UCB is constituted both as a therapeutic tool and embedded in social relations. My main focus was the discursive constitution of different social formations (the large collectivity and patients in need of transplantation versus the family) and how the clinical practices of banking and using UCB stem cells are connected to these formations, generating different forms of social embeddedness. The aim is to demonstrate that discourses about UCB banking (donation or family preservation) play a role not only in shaping the public understanding of these biomedical practices, but they are also important elements in the process of entanglement of heterogeneous associations that structure the different frames in which the decision about how to bank UCB takes its shape.

### **3. The discourse of public UCB banking**

In the vast majority of documents retrieved from the websites of public UCB banks and collection sites (64.5%), UCB donation is mentioned without any adjective. In 35.5% of analysed documents, donation is instead named as *solidaristic* a total of 101 times. The more technical definition of allogeneic donation is mentioned 77 times, but associated with the adjective *solidaristic* (“allogeneic or solidaristic donation”, “allogenic donation for solidaristic purposes”) in 41 mentions, and with the adjective *altruistic* (“allogenic donation, that is altruistic”) in 8 mentions. This rhetorical practice of naming donation as an act of solidarity is associated to a discursive strategy of entanglement that attach a particular clinical use of UCB to a moral value.

Clinically, UCB donation is attached quite exclusively (128 times) to therapeutic uses within established treatments for haematological malignancies (leukaemias and lymphomas), blood and metabolic disorders (such as thalassemia) and inherited immunodeficiencies – what Martin et al. (2008) call the “regime of truth”. Other uses in regenerative medicine – for treating neurological disorders, diabetes or for organ repair – are instead criticised as speculative and, in particular, as an exaggerated claim by private UCB banks to attract clients. Public UCB banks and collection sites often emphasise that discarded UCB units (which are discarded because their volume is too low for transplantation) are important biological resources for clinical studies and basic research in haematology, transfusion and transplantation, or for testing the quality of UCB processing and banking techniques. The discourse thus shapes the public understanding of UCB clinical application as only within the standard protocols established in

haematology, disentangling UCB stem cells from the promissory discourse of regenerative medicine.

The emotional themes of hope and promise are instead deployed in the “regime of truth” through the moral appeal of saving the lives of sick children and people with illnesses, as well as through the offered hope of finding a compatible donor and the possibility of a concrete opportunity for treatment:

“Umbilical cord, which is normally thrown away, contains a blood rich with stem cells... A woman deciding to donate this blood offers many sick people extra hope to heal and return to life.” (Azienda Ospedaliera S.G. Moscati, 2019)

In this discourse, therefore, the clinical use of UCB in allogeneic transplants is entangled with the morality of “a great act of solidarity” (UNICATT Cord Blood Bank, 2018).

Providing hope to patients – especially children – who lack a compatible donor is presented in these documents as a way of conceiving motherhood within a logic of care and gift giving: the mother gives life to, and takes care of, not only her child, but other sick children too. This marks an important articulation of social embeddedness, which should be discussed in detail.

### *Disentangling families, entangling the collectivity*

According to Callon (1998), for an object to circulate in any exchange, the object has to be disentangled from certain existing relations and entangled in another set of relations.

What the discourse of the public system of UCB banking does is precisely this: detaching

and attaching (Callon et al., 2002) UCB with social formations that are structured in the discourse itself. In other words, the discourse produces embeddedness by defining social formations and their related values and social relationships, and attaches to them a particular framing of UCB banking and clinical application.

In order to circulate UCB in the international registry of available haematopoietic stem cells for transplantation, public biobanks have to disentangle UCB from the existing attachment to the mother and her family. Materially, this is done by draining UCB from the umbilical cord after childbirth; legally, by asking the mother to relinquish any ownership over the donated tissue, and making the tissue available in international stem cell registries. Thus, UCB in public donation procedures is disentangled from family relationships.

However, as noted by Callon (1998: 37) in the case of organ transplantation, any disentanglement is always combined with entanglements. In order to allow the circulation of a clinically safe UCB unit, this UCB unit must be entangled with the clinical history of the mother, the father and their family. The technology of this entanglement is an anamnesis form that collects medical data, cases of genetic disorders affecting the family, and the mother's risky behaviour that may implicate the transmission of infections (e.g. Fondazione IRCCS, 2017a; 2017b).

In other words, UCB is *legally* disentangled from family as a *social* formation but is entangled in family as a *biological* formation.

This reframing of family as a biological collective is even more pronounced in the case of the so-called dedicated UCB collection, where public biobanks collect UCB for

autologous or family-related uses at no charge in the case of pathologies affecting a member of the family or in the case of a documented family history of genetic conditions (see section 2). The family can retain ownership over the UCB only because it is considered a collective at biological risk. This also applies in cases where there is an unexpected occurrence of a pathology, but only “upon request of a physician” (UNICATT Cord Blood Bank, 2018). These arguments are used to dissuade mothers from private UCB banking, by showing that in any case of documented need, they can retain ownership. However, from a legal point of view, UCB is entangled with the family only when the family is considered biologically at risk of existing or occurring pathologies.

However, the family as a social and affective formation is not completely dissolved, but is reconstructed by embedding it in other bundles of social relationships. It is entwined with the theme of solidarity, partially discussed above, through naming donations as *solidaristic*. Donation is defined as an act of solidarity (43 times), of generosity (18 times) and as an act of love (18 times), but what is of worth is the recipient of these ethical gifts:

“Cord blood donation is an *act of great solidarity, of civil development and of high social value* ... [it] nourishes a *collective good*, available to any recipient, at any time and anywhere in the world.” (Azienda Ospedaliera di Cosenza, 2019)

“... cord blood is not indeed preserved for the family itself, but for the *whole population*.” (Azienda Sanitaria Unica Regionale di Jesi, 2019)

The theme of generosity and altruism is what makes UCB donation a link between the affective relationships within the family and the complex of social bonds of reciprocity, solidarity and mutuality. In this way, more than substituting family loyalties with a sense of responsibility for the collectivity, donation operates an enlargement of the moral and affective formation in which the family is inserted.

“[It] is an act of solidarity, humaneness and love. The umbilical cord of your baby can save a life. Tomorrow, an umbilical cord donated by another mother may save someone you love.”

(Ospedale Internazionale di Napoli, 2019)

As the above excerpt shows, donation not only nourishes a “*solidaristic public capital*” (Azienda Ospedaliero-Universitaria di Parma, 2012) or “a *social asset for the life itself* ... a fundamental element for the *consolidation of civil relationships*” (Ministero della Salute, 2009). It also create a biological link of reciprocal protection among families within the collectivity: the internal logic of care associated to motherhood and parenthood is extended, through reciprocity, to other families within the larger community. Through the rhetoric of generosity, solidarity and reciprocity operates an entanglement between the allogeneic use of UCB and a mutual logic of care, that frames the immunization against biological risks not as an act of alienation of a bodily tissue, but as an act of sharing of both corporeal resources and sentiments of social and civil obligation.

UCB donation is often presented in pregnancy books and antenatal classes together with information on natural childbirth, skin-to-skin contact and breastfeeding, creating an assemblage of practices defining an ideal view of pregnancy and childbirth in which



UCB donation is an integral part of a logic of care. Donation is thus constructed as a solidaristic and generous way with which a family takes care of the large collectivity in which it is embedded and, through reciprocity, the way in which the collectivity takes care of any family when it is at biological risk.

#### **4. The discourse of private banks**

As noted by Martin and colleagues (2008), while public banks operate in the regime of truth, private banks advertise their services by linking them to what these authors call the “regime of hope”. In other words, private banks invest a lot in promoting UCB stem cell banking for possible future application in regenerative medicine: in 29% of the webpages of private UCB banks operating in Italy, family conservation is justified by stating that these stem cells can be used for treating neurological conditions such as cerebral palsy (31 times), autism (16), diabetes (19) and other conditions including myocardial infraction, amyotrophic lateral sclerosis, multiple sclerosis and Alzheimer’s. This, however, does not mean that private banks avoid the “regime of truth” (Martin et al., 2008): the number of pathologies routinely treated with UCB haematopoietic stem cell transplantation is frequently mentioned, as is the number of transplants performed worldwide. Private banks also advertise a service of UCB preservation for autologous and family uses within the standard protocols of UCB transplantation for haematological conditions. Their logic is based on a partial appropriation of the discourse of “otherwise waste” used by public banks (see also Brown, 2013: 98). Indeed, in the public sector, it is often remarked that, if not collected, UCB is discarded as a medical waste instead of

being used as precious life-saving tissue. Private banks add to this discourse that the public sector is ineffective in collecting UCB – “Italian public banks preserve less than 0.4% of available cord blood” (Bioscience Institute, 2019a). Otherwise waste is thus translated into a rhetoric of public wastage of this biological resource, due to the 75% risk of not being able to donate (SmartBank Scientific, 2019a) if the childbirth happens “during the night, weekends and holidays” (FamiCord, 2019c). Finally, private banks contrast the 25% to 30% likelihood of finding a compatible donor among family members with the probability, “ranging from 1/50,000 to 1/100,000”, of finding a non-related histocompatible donor in international registries (SmartBank Scientific, 2019b).

However, in order to discursively construct their scientific, ethical and social legitimacy, private banks avoid to present themselves as opposed to public banking. They indeed stress their involvement in clinical experimentation programmes and clinical trials in cooperation with public healthcare institutions. In this way, private banks aim to demonstrate both that their claims regarding UCB applications in regenerative medicine are not misleading adverts to attract customers, and that by collaborating with public research and healthcare institutions they act out of a sense of social responsibility for the future health of sick people. Similarly, they declare their involvement in so-called hybrid or mixed banking models (O’Connor et al., 2012) – namely, private banks running programmes for UCB donations to national and international haematopoietic stem cell registries or dedicated UCB preservations at no charge for families with a member who needs a stem cell transplant (for a critical discussion, see Patra and Sleeboom-Faulkner, 2016). Cord Blood Center (2019), CryoSave (2019), FamiCord (2019) and Swiss Stem Cells Biotech (2019) declare that they run similar programmes. In more detail, as noted

by Hauskeller and Beltrame (2016a; 2016b), collaboration with the public sector and hybrid programmes are discursive devices aimed at showing that these enterprises de-commodify part of their services for ethical reasons, in order to gain both scientific legitimacy (through cooperation with the public sector) and symbolic capital (i.e. their mission is ethical and not just for profit). These are then economically capitalised on as advertising to attract customers.

But in contrast with public banks – where risk prevention lies in the collectivization of UCB through donation – private banks produce a discourse about UCB scarcity and the risk of availability in the public sector, that could be prevented only within the family, and thus they foster a “hoarding economy” that, according to Fannin (2013), underpins their operative logic and has important implication for the discursive production of social embeddedness.

#### *Entangling the family as a biological-and-affective formation*

Private banks define themselves as family banks and, indeed, the possible use of UCB for family members is mentioned more than the possible autologous use (70 times versus 10 times). While the family is considered only when currently affected by a condition or actually at risk in public UCB banking discourse, the risk is latent in private UCB banking discourse. But the family is the only biological collective that can provide immunity and private banking is the only technology to secure it, as public UCB banking is ineffective. In this way, this technology is easily entangled in a discourse about parenthood and in what Brown and Kraft (2006) call kinship responsibilities. But private

banks do not simply exploit mechanisms of embeddedness in family relationships – they discursively construct the family as a *biological-and-affective* social formation, entangling a UCB banking practice in it and in its related responsibilities and obligations. In other words, they construct and mobilise social embeddedness in family and kinship ties.

They have several ways of doing this. They claim that family banking allows “you [to] protect your family [...] for real” (FamiCord, 2019d), as it is “a health supply for your babies and the whole family [...] your first act of love with which you safeguard a priceless health capital” (InScientiaFides, 2019a). Moreover, they use “stories” and “comments” by costumers to mimic and provoke mechanisms of embeddedness. In a famous study, DiMaggio and Louch (1998: 260) identify two main strategies with which people solve the uncertainties and risks related to an economic transaction: 1) “search embeddedness”, when actors use social relationships to assess the reliability of potential transaction partners; and 2) “within-network exchange”, when actors choose people with whom they have pre-existing non-commercial ties as transaction partners. Private banks use clients’ “stories” to mobilise a sense of parental responsibility and to generate embeddedness.

Firstly, these stories are used to engender in potential clients a sense of parental obligation:

“Becoming aware of the fact that we would soon become parents made us immediately think about what we could do to protect the future of our little boy.” (InScientiaFides, 2019b)

“I think that all parents in the world want the best for their children; we invest ourselves in their future [...] let’s start by banking stem cells.” (SmartCells, 2019)

Secondly, these stories are used as substitutes for “search embeddedness” by reporting comments by existing costumers who recommend the bank (e.g. SmartCells, 2019) or who have used the bank several times (InScientiaFides, 2019b) or who describe a network of social ties that chooses the bank over and over again:

“Having been happy with you in every respect [...] and having recommended your service to my sister and having been happy again, my partner and I have chosen to turn to you to give a special gift to my sister-in-law.” (SmartCells, 2019)

Search embeddedness is also stimulated by the “refer a friend” promotion offered by several private UCB banks: clients referring the service to friends receive a discount on their annual storage fee. This is not only a marketing strategy to exploit personal and social networks so as to enlarge the pool of clients, but also a mechanism engendering search embeddedness, as existing clients testify regarding the reliability of the company to people with whom they have non-commercial ties. As Santoro and Romero-Bachiller (2017: 293) show, these are not simply marketing strategies, as banking decisions are often the outcome of discussions with relatives and acquaintances.

Thirdly, private UCB banks also try to mimic the mechanism of “within-network exchange”, as they emphasise, in the stories reported, the creation of affective relationships going beyond commercial transactions. Private banks select and publish clients’ comments highlighting the support and assistance received, and particularly

SmartCells (2019) publishes comments in which the creation of affective ties have been developed during the process of collection and banking:

“Thank to Carlotta, who is now almost one of my family.”

“Thank you so much. Not only for the compliment [to our son] but for all these months when you were so close to us.”

“I allow myself to call you by your first name because... in short, we shared a great adventure together, a wonderful journey, a beautiful result!!!! I was really pleased to hear from you again.”

In this way, private banks transform a commercial transaction of a commodified biomedical service (Hauskeller and Beltrame, 2016b) into a socially embedded exchange. Brown and Kraft (2006: 325) define private UCB banking as “a significant techno-moral entry point into an increasingly private linkage between parenting and biomedicine”. The mobilised “blood ties” and parental responsibilities make family banking services “no longer simply a monetary matter but literally a corporeal matter” (ibid.), as well as relational and intersubjective. In other words, as Santoro and Romero-Bachiller (2017: 293) point out, UCB banking involves the activation of the affective and relational dimensions of care. However, these ties and responsibilities are not simply accessed – they are discursively constituted as self-realising by resorting to this banking technology. What the discourse of private UCB banks does is simultaneously depict the family as an affective/social formation *and* a biological formation, and entangle the banking service in the relationships, responsibilities and moral imperatives attached to parenthood. At the same time, the embeddedness in other social relations of mutuality and obligation to the collectivity is disentangled by representing a future of biological risk against which

public banking is ineffective due to the difficulty of finding compatible donors outside of the family and the general wastage of UCB.

## **5. Discussion and conclusion**

In her famous work on the development of life insurance schemes in the United States, Viviana Zelizer (2017) documents how, at the beginning, this practice was strongly opposed as profaning the sacred sphere of life and death by introducing a monetary equivalent of what was considered *res extra commercium*: the value of man's life. Moreover, an impersonal market system of exchange was seen as endangering the moral web of bonds, obligations and reciprocity characterising the informal economic assistance given by the community to orphans and widows (ibid.: 103). Life insurance schemes established themselves as legitimate not through the desacralisation of life and community benevolence, but by presenting themselves as moralised and sacralised rituals of good and responsible fatherhood (ibid: 63). This narrative of fatherhood was both morally superior to community beneficence as the fulfilment of a father's duties and responsibilities, and technically more efficient as a protective instrument (ibid: 133).

The work of Zelizer is interesting not only because the story of life insurance companies resonates with that of private UCB banking, but also because it shows how any form of exchange (market and non-market) places its morality and its embeddedness in sets of social relations. Zelizer explores how life insurance companies constructed their morality by attaching their marketed services to a bundle of obligations linked to the idea of good and responsible fatherhood. Her approach is consistent with Michel Callon's (1998)

notion of entanglement, which explains the structuring of “commercial transactions and other types of relations” by refusing to consider goods and services exchanged as disembodied objects that need culture to be added to them (Callon, interviewed by Slater and Barry, 2002: 292). On the contrary, any exchange happens through the production of “more and more attachments, relations and proximities” that stabilise a frame (ibid.: 293).

The notion of entanglement, therefore, enables us to analyse the production of embeddedness in the structuring of particular frames of UCB banking. Instead of simply opposing two different types of embeddedness (in the larger collectivity or in the family), and instead of contrasting “good citizenship” with “good motherhood” – as described by Porter et al. (2012) but “good parenthood” is more apt in this case – following this analytical framework, this paper has shown the entanglement of constituted social formations and their related obligations, responsibilities and loyalties with banking practices and clinical uses of UCB stem cells. The social embeddedness of the two banking practices is the outcome of the attachment (Callon et al., 2002) of UCB banking models and clinical applications to the world of discursively constructed social formations.

Expecting mothers and prospective parents entering into the frame of UCB donation are exposed to a discourse and practices that disentangle UCB from family attachment and entangle it in a network made of technologies for its redistribution, a conceptualisation of UCB stem cells as life-saving tissues in allogeneic haematological transplantations, the clinical uselessness of autologous preservation, the speculative nature of regenerative medicine applications, and the moral values of solidarity, mutuality and obligation to the collectivity. Embeddedness in these social relationships is constituted by constructing the



social formation of the “collectivity” as bounded together by a need for “immunity” (Brown et al., 2011) and by the circulation of donated UCB as a corporeal and moral/social link within it. The discourse about the generosity of donation and the themes of solidarity, mutuality and reciprocity operate to connect the affective ties within the family to an enlarged collectivity in which the collectivization of the UCB is socially embedded in the moral collectivization of a logic of care. The family is biologically protected by detaching UCB from an internal logic of care and by attaching UCB to the large collectivity.

Prospective parents entering into the frame of family UCB banking are, instead, inserted into different entanglements, where the discourses deployed by private banks constitute a network connecting the technology used in family banking, research in experimental stem cell treatments, UCB as a family biological asset that both protects against haematological risks and assures resources for the future development of regenerative medicine, and the family as a *biological-and-affective* collective that fulfils its obligations by entering into this entangled network of entities. At the same time, this discourse operates to disentangle UCB from the wider collectivity and the technology of international registries, by constructing biological risk for which the public system is ineffective as it is not able to prevent the waste of UCB and thus generates its scarcity. The same need for “immunity” (Brown et al., 2011) is now fulfilled only within the affective-corporeal dimension of the family, as the value of UCB for the family “resides precisely in its not being alienated, in its perpetual retention” (Waldby, 2006: 63) as a moral obligation and a biological insurance. Immunity is thus a family affair.

In conclusion, adopting the framework of entanglement enables a better understanding of the production of social embeddedness in different UCB banking choices. While in the standard narrative of opposition in bioethical and biomedical literature embeddedness is already given, in this approach is instead possible to investigate how different social embeddedness are discursively deployed and enacted through entanglements into banking practices. In this way, it can contribute to the study of how parents make decisions about UCB banking. Instead of positing a clear-cut demarcation between “those who... will value real public benefit against ... individual benefit” (Eckert and Greene 2005, 1283), the approach outlined in this article allows to explore the decision-making processes by linking emotions and expectations of mothers and prospective parents with the entanglement of banking practices, clinical applications, and biological risks and immunity protection through the role of discourses deployed by involved institutions in shaping frames of UCB banking, social formations and the related moral values.

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