
Moral Status, Human Identity, and Early Embryos: A Critique of the President's Approach

David DeGrazia

On August 9, 2001, President George W. Bush delivered a statement that would have a great effect on bioethics policy in the United States.¹ The President stated his belief that human life is a sacred gift from the Creator, expressed his strong opposition to any type of human cloning, and announced a policy of restricting federal funds for embryonic stem cell research to studies on stem cell lines already in existence at the time of his statement. He also announced his intention to create the President's Council on Bioethics (PCB), headed by Leon Kass, "to monitor stem cell research, to recommend appropriate guidelines and regulations, and to consider all of the medical and ethical ramifications of biomedical innovation." On November 28, 2001, President Bush formally created the PCB, which began its deliberations the following January.

In discussing his newly announced policy on stem cell research, the President crisply stated two convictions at the heart of his moral thinking: "There is at least one bright line: we do not end some lives for the medical benefit of others. For me, this is a matter of conviction: a belief that life, including early life, is biologically human, genetically distinct and valuable."² The first conviction is classically deontological: we may not intentionally kill human beings even for the medical benefit of other human beings. The second conviction, on which I will focus, concerns when human life, in the biological sense, has moral status: as soon as it comes into being. More strongly, since Bush clearly means that the value of human life is precisely the value that prohibits killing some to benefit others, human life in the biological sense has *full* moral status – including a right to life – as soon as it comes into being. (By "a right to life" I will mean a very strong moral protection against being killed.) And when, exactly, does it come into being? In this view, "nascent human life" begins at conception when sperm and egg unite, producing a single-cell zygote.

Importantly, the PCB, created after Bush determined his policy regarding stem cell research, did not authorize this policy in the form of a prior recommendation; it was a *fait accompli*. Nevertheless, in addition to providing an overview of the ethical and policy issues, and an update of scientific developments, the PCB's report on stem cell research endeavors "to clarify and explain the current federal policy regarding stem cell research and to make clear the legal, ethical, and prudential foundations on which the policy rests..."³ To this extent, the PCB articulates Bush's position on embry-

David DeGrazia, Ph.D., is Professor of Philosophy at George Washington University. His most recent book is *Human Identity and Bioethics* (Cambridge University Press, 2005).

onic stem cell research without explicitly endorsing it. In its earlier report on human cloning, the PCB was more argumentative.⁴ The council unanimously judged “cloning-to-produce-children” to be unethical and appropriately banned by federal law. Regarding “cloning-for-biomedical-research,” a majority of ten (out of 17) members recommended a four-year ban. Among that majority, several members share Bush’s view that cloning-for-biomedical-research is intrinsically wrong because it involves the destruction of human embryos.

The target of this essay’s critique is the President’s view regarding when human beings come into existence, and when they have moral status, a view whose intellectual foundations the PCB reconstructs and articulates in the two aforementioned reports. Underlying this ontological-cum-moral vision are two pivotal assumptions: (1) we originate as single-cell zygotes at the time of conception; and (2) we have full moral status as soon as we originate. I will challenge both assumptions, argue that at least the second is mistaken, and conclude that the President’s approach is incorrect. My conclusion is intended to undermine the strongest grounds for opposing cloning-for-biomedical-research and for imposing severe restrictions on embryonic stem cell (ESC) research.

Regarding Our Origins

The question of when we originate, or come into being, is conceptually tied to the question of our essence: what are we human persons, most fundamentally? Which of our properties are so fundamental that their loss would entail our going out of existence? An answer to this question will tell us which properties have to be in place for one of us to exist; when those properties first appear, one of us originates. A related question, which has received more attention in the philosophical literature, concerns our numerical identity: Once we have come into being, what are the criteria for our continued existence over time?

One view of our essence, which I call person essentialism, holds that we (who are now) human persons are essentially persons – where persons are understood, roughly, as beings with the capacity for relatively complex forms of consciousness.⁵ (I will hereafter use the term “person” in this way.) According to person essentialism, you would not survive in a permanent coma; the human organism that continues to breathe spontaneously would not be you. Elsewhere I have argued that person essentialism is highly implausible.⁶ It implies, for example, that you were never a newborn.

Because newborns lack the capacity for complex forms of consciousness, they are not persons, from which it follows – if person essentialism is true – that no human person is numerically identical with any newborn of the past. I take it that each of us was once a newborn, contrary to person essentialism. Another major problem with person essentialism, although I can’t enter into details here, is that it appears to lack an adequate characterization of the relationship between any person and the human organism associated with her.⁷

The target of this essay’s critique is the President’s view regarding when human beings come into existence, and when they have moral status, a view whose intellectual foundations the PCB reconstructs and articulates in the two aforementioned reports.

A somewhat more plausible view of our essence, defended by Jeff McMahan, is that we human persons are essentially minds: beings with the capacity for consciousness – that is, for at least some conscious states.⁸ Late fetuses and newborns are clearly sentient and therefore have some conscious states. Thus mind essentialism does not imply that none of us was ever a newborn. It does imply, though, that we were never pre-sentient fetuses. While I find that dubious, many people do not, so this implication is not so clearly a problem for the view. I suggest, however, that like person essentialism, mind essentialism lacks an adequate characterization of the person/human organism relationship. However, I won’t pursue that concern here.⁹ It is enough for present purposes to note that mind essentialism is a contentious thesis: while not obviously wrong, it’s not obviously correct either.

For the rest of this paper, I will assume a view about our numerical identity and essence – the biological view – which I have defended elsewhere and which, interestingly, President Bush also apparently assumes. This is the view that we are essentially human organisms, so that we exist as long as we are biologically alive and we come into being whenever the human organism does.¹⁰ (Anyone who rejects this view may regard my argument in more pragmatic terms: Even if we grant Bush’s implicit assumption about our identity and essence, his moral view regarding early embryos proves indefensible.) Bush’s assumption of the biological view motivates the idea that we originated as single-cell zygotes; all he needs to reach that thesis is the premise that human organisms like us first come into being at conception. Confidently asserted by the Vatican,¹¹ and assumed by countless people ranging from fundamen-

talist pro-lifers to many secular humanists, the thesis that we come into existence at conception may seem an inevitable consequence of the claim that we are essentially human organisms.

I argue, however, that this view of our origins is highly questionable. My argument stresses that we are uniquely individuated human organisms. But unique individuation may not occur until after at least several cell divisions. Let me explain.

For about two weeks after conception, the embryo can divide into two or more parts that go on to develop into human beings, and it can merge with another embryo and develop into a single human being. Let's call this case of division monozygotic *twinning* (although division into triplets or even quadruplets, while rare, is possible). The resulting embryos, from which identical twins derive, have virtually identical DNA.¹² By contrast, "fraternal" twins, resulting from the fertilization of two eggs in one cycle, are likely to have no more genetic similarity than ordinary siblings. Let's call *fusion* the unusual occurrence in which two embryos, the result of fraternal twinning, merge into one, a chimera. The chimera has two complete sets of DNA, which somehow compete, or perhaps cooperate, in determining (along with prenatal and postnatal environment) the individual's phenotype – actual characteristics, such as height, eye color, and talents.

So, until about two weeks after conception, an embryo can divide into two and, in cases of fraternal twinning, two embryos can fuse into one. Arguably, then, the single-cell zygote is not yet uniquely individuated in the sense that whether it, and it alone, will develop into a single human organism has not been determined. If not uniquely individuated, the zygote is not yet a unique member of our basic kind (according to the biological view): human organism.

Consider any two adult identical twins and any adult chimera. The twins derived from one and the same zygote. If each human organism originated as a single-cell zygote, then each of the twins originated as the very same zygote. But this is an incoherent result. For the two twins are numerically distinct from each other, so they cannot both be identical to a single earlier zygote.¹³ Meanwhile, no chimera could have originated from a single one-cell zygote because two distinct organisms were needed to furnish her genome. Surely she wasn't individuated until fusion occurred; and the twins were not individuated until twinning took place. Neither identical twins nor chimeras could have come into being at conception. (As we will see in a moment, however, one contending model of twinning will somewhat complicate this claim.)

Now, one might wonder whether human beings who are neither identical twins nor chimeras might have

originated at conception. After all, those who are the unique continuants (unlike identical twins) of a single zygote (unlike chimeras) can trace a single continual path of development from conception to the present. But the possibility of tracing this continual path is consistent with the thesis that the single-cell zygote is merely a precursor to a human organism like you or me. This thesis draws support from further arguments and facts about embryonic development – although, as we will see, these considerations are less than conclusive.

Consider two understandings of how twinning occurs.¹⁴ According to the *division* model, which I take to be the more traditional understanding, an embryo divides into two embryos approximately equal in size. According to the *budding* model, a blastomere (cell) emerges through the membrane known as the zona pellucida, leaves the original embryo, and develops independently. We currently do not know which of these models is correct; possibly each is correct in some instances. If we come into existence at conception, as the President assumes, what happens to the original human organism in twinning cases? If division occurs, then presumably the original organism exists, very briefly, before vanishing at the time of twinning; whenever an embryo divides in twinning, a human organism (of our kind) goes out of existence. This coheres with the thesis that, while non-twins originate at the time of conception, identical twins come into being at the time of twinning.¹⁵ If, on the other hand, budding occurs, the original human organism would continue to exist despite losing one of its cells; that cell, which goes on to develop, would constitute a new human organism. Thus, budding entails that one twin originates at conception whereas the other originates a short time later. These are the implications of the view that we (that is, most of us) originate at conception.

Are these implications plausible? Surely it's a bit odd *prima facie* that at least some twins and the rest of us – who are of the same basic kind – should originate at different stages of prenatal development. This oddity might be theoretically tolerable, but it's connected to a deeper concern. Arguments for the claim that (most) human beings originate at conception emphasize the importance of continuity from conception to any later stage.¹⁶ These arguments deny that the embryo could be a precursor to an individual of our kind (as I claim) because "[T]he predecessor of something...cannot be continuous with the entity of which it is the predecessor."¹⁷ But there is spatio-temporal continuity between the zygote and the later twins, each of whom can trace her developmental path back to a zygote whose complete human genome determined theirs. Now, again, it is impossible for both twins to be numerically identical

to the zygote. I suggest, then, that in no cases of prenatal development – including those involving non-twins (and the “original” in any cases of twinning by budding) – do spatio-temporal continuity and continuation of the same genome entail identity, because the product of conception is not uniquely individuated. Arguably, none of us originates as a single-cell zygote.

This claim receives additional (though not conclusive) support from further facts about prenatal development. So far I have stressed that the zygote-cum-embryo is not uniquely individuated. But, as we will see, it may not even be a human organism of the kind that you and I instantiate. For the first few cell divisions – according to one prominent genetic understanding – it is more like a colony of cells loosely conjoined by the zona pellucida (the membrane that holds the cells together).

Before turning to facts that bear out this assertion, a clarification about organisms is in order. Organisms are characterized by internal complexity featuring the interdependence of different subsystems and the drawing of energy from the environment to maintain internal order and resist entropy. But organisms come in enormous varieties. Some consist of only one cell. Even a cell features great internal complexity and interdependent subsystems. Now, to be sure, a single-cell zygote is an organism. And it is a human organism as contrasted, say, with a feline or bovine organism. But it does not follow that it is a human organism of the same kind as you and me.

For the first few cell divisions, according to the present school of thought, the embryo functions less like a single integrated, energy-using unit – of the sort we call an organism – than like a collection of single-cell organisms loosely and contingently stuck together. That’s precisely why spontaneous twinning and fusion remain possible. (The very nature of the early embryo entails the possibility of twinning and fusion and arguably, with this possibility, lack of unique individuation.) After the sperm cell enters the egg, their two sets of 23 chromosomes remain separate for about a day. As biologist Lee Silver explains, contrary to popular belief, fertilization itself is completed only at the two-cell stage.¹⁸ Two further divisions in the next couple of days yield an eight-cell embryo. Significantly, each of the eight cells retains the potential, if separated, to produce a human organism like you or me.¹⁹ There is so far no specialization of cells to perform distinct tasks; nor is there significant interaction or integration among them. In this sense they are tantamount to a colony of eight contingently joined zygotes. They have yet to function as a single, integrated organism.

Cell differentiation begins – the argument continues – at the 16-cell stage, as the outer cells begin to

transform into what will be the placenta.²⁰ Division precedes as the embryo travels through the fallopian tube, entering the uterus on about the fifth day after fertilization. (By “fertilization” I mean the beginning of fertilization.) Between seven and eight days after fertilization, it attaches to and penetrates the uterine wall, making connections with the mother’s blood supply. But the middle cells have not differentiated and the embryo could still split spontaneously into two viable organisms. On day 14 or 15 some middle cells differentiate and it is now determined which cells will become part of the placenta and which will become part of the fetus. Within a day, in the portion that will become the fetus, a column of cells differentiates into the “primitive streak,” the precursor to the spinal cord. Spontaneous twinning is now impossible.²¹ The human organism is now uniquely individuated and it clearly functions as a single integrated unit. From a biological understanding of our essence, a uniquely individuated human organism is a being of our kind.

So, once spontaneous twinning has been precluded and all parts of the embryo are differentiated at about two weeks after conception, one of us has come into being. But maybe we should allow that the human organism emerges earlier, when differentiation *begins* at the 16-cell stage – making the full package “more than the sum of its parts.” Rather than drawing a specific line marking our origins, I (tentatively) advance two claims: (1) we do not exist, before the 16-cell stage, as completely undifferentiated, preimplantation embryos; and (2) by the time all parts of the embryo are differentiated and twinning is precluded, one of us has come into existence. Perhaps we come into existence somewhat gradually, emerging over a nontrivial stretch of time rather than at a single moment.

The argument just sketched – that we come into being no earlier than the 16-cell stage and perhaps as late as a couple of weeks after fertilization – stresses the possibilities of twinning and fusion and the absence of integration within the embryo. This embryological picture can be challenged, however, by the claim that there is significant integration very soon after fertilization.²² Suggesting this possibility is a report of several experiments involving mice embryos, the upshot of which is that in mice evidence of cell differentiation appears as early as the two-cell stage.²³ If integration occurs very early in mice, is the same true of humans? Yes, according to at least one recent biology textbook, which asserts differentiation in humans as early as the two-cell stage.²⁴

If this alternative picture of embryonic development is correct, then integration does exist as early as the two-cell stage. This would challenge my assertion that, lacking significant integration, the early embryo is akin

to a set of single-cell zygotes and is not uniquely individuated. Yet twinning and fusion remain possible through the first two weeks. The wisest approach at the present time, I think, is to admit uncertainty. So it is only tentatively that I contend that each of us came into existence between the 16-cell stage and the time at which twinning is precluded.

Having done so, I will now provide further support for the specific thesis that we do not originate as single-cell zygotes. Consider prenatal genetic diagnosis, in which a cell is removed from an embryo (as early as the two-cell stage) in order to test for predisposition to genetically determined diseases. Once this cell is removed, it is effectively an independent zygote; provided an artificial zona pellucida, it could develop like any other embryo. Yet virtually no one objects to this procedure, which invariably results in the death of the cell whose DNA is examined.

abortions – including the majority that occur prior to implantation without the woman even realizing she was pregnant – as involving a terrible loss. (And those who believe in an afterlife must picture unborn beings constituting its majority population.) I imagine nearly everyone will find these implications incredible.

If my arguments have been on the right track, the pre-individuation embryo is not a human organism of our kind – nor does it have the *potential* to become one of our kind.²⁶ Rather, it is a precursor to one of us, being numerically distinct from any human organism of our kind that may eventually develop. (If A and B are numerically distinct, A cannot become B.) Like a viable egg, the early embryo is necessary for one of us to come into being, but neither this necessity nor a full complement of DNA confers substantial moral status upon it.

Not until the time of unique individuation, in my

If my arguments have been on the right track, the pre-individuation embryo is not a human organism of our kind – nor does it have the *potential* to become one of our kind. Rather, it is a precursor to one of us, being numerically distinct from any human organism of our kind that may eventually develop.

Now, clearly, a single-cell zygote has the *potential* to develop in a way that eventually produces one of us. But the importance of this potential is dubious. After all, since mammals can be cloned from somatic (i.e., nonreproductive) cells, each of millions of cells in your body has the potential to develop in a way that produces a full-grown human organism. Surely this confers no particular moral status on your many individual somatic cells; nor does it suggest that each cell is one of us.

One might reply that neither a cell extracted for prenatal genetic diagnosis nor an ordinary somatic cell are in a state that *naturally* leads to cell division and later birth. Perhaps natural potential matters in a way that artificial potential doesn't. But a single-cell zygote produced by ordinary conception isn't in a state that naturally leads to birth – if by “natural” we mean “most likely to occur” – because roughly 75 percent of pregnancies terminate spontaneously.²⁵ To be sure, some will interpret potential by reference to a different sense of “natural,” such that the natural course of events in pregnancy leads to birth. Maybe some such sense of “natural” is significant. Still, if the single-cell zygote is a human organism of our kind, two extraordinary implications follow: (1) three-quarters of humanity is never born; and (2) those who, like the President, ascribe full moral status to us from the moment we originate, should regard the fate of embryos in spontaneous

view, is there a promising candidate for substantial moral status. If the arguments regarding twinning and fusion are the most salient, it is not until 14 or 15 days after conception that one of us emerges. This would be very important to the ethics of ESC research and cloning-for-biomedical-research. Stem cells become available for extraction at the blastocyst stage, between five and nine days after conception, when the embryo has about 200 cells.²⁷ Now, stem cells extracted from *cloned* human embryos, produced specifically for such research through somatic cell nuclear transfer, may prove uniquely valuable in studying genetic diseases and developing novel therapies. One exciting prospect for using cloning to derive ESCs involves deriving the cells used to treat a particular patient from her own skin cells, precluding the tissue mismatches that cause immune rejection.²⁸ So liberalizing policies for ESC research and cloning-for-biomedical-research prior to two weeks after fertilization could prove to be a great boon for biomedical science.²⁹

But, even if my arguments have been on the right track, they leave uncertain whether unique individuation occurs as late as two weeks after conception. Perhaps it occurs as early as the 16-cell stage, when differentiation begins, making the package of cells sufficiently like a single integrated organism to count as one of us. Liberalizing policies for embryo research only before the 16-cell stage would not permit extrac-

tion of stem cells. Suppose, instead, we emphasize the ambiguity of when unique individuation occurs, stressing the full grey area between the 16-cell stage and the time at which twinning is precluded. Then it would be quite unclear where to draw a line for the permissibility of research that involves embryo destruction. It seems, therefore, that even if my arguments regarding our origins undermine the view that we originate at conception – an open question, given the alternative understanding of embryology discussed above – these arguments do not by themselves motivate liberalizing policies regarding ESC research and cloning-for-biomedical-research. That purpose requires us to confront more directly the President’s second assumption: that we have full moral status as soon as we originate.

Do we have Full Moral Status When we Originate?

Whether for religious reasons or because they find the idea inherently reasonable, many people assume that we have full moral status the moment we come into being. But this assumption is not self-evident. Indeed, I will suggest that at least prior to the point at which a fetus becomes sentient – which apparently occurs at around six months’ gestation³⁰ – its moral status is only partial.

As with many other philosophers, I hold that sentience is central to a determination of moral status.³¹ Sentience is the capacity to have feelings. In the world as we know it, all beings that can feel can feel at least pain and pleasure; and all beings that have more advanced states of consciousness are also sentient, experiencing pain and pleasure. So, in the world as we know it, all and only sentient creatures can have pleasant or unpleasant experiences – which are plausibly regarded as the most basic foundation for interests. Insofar as all and only beings that can have interests can be harmed or benefited in ways that seem (directly) morally important, sentience is a reasonable basis for assigning moral status. Now, if I am right about our origins, we originate as nonsentient beings – providing some reason to doubt that we come into existence with substantial moral status. I say “some reason” because the precise relationship between sentience and moral status is far less certain than the claim that sentience is at least one important determinant of moral status.

Many people hold that personhood – in something like the sense defined earlier, which requires the capacity for complex forms of consciousness – is an important determinant of moral status.³² If I am right that sentience is sufficient for moral status, personhood (in this sense) cannot be the whole story; we become sentient beings before we become persons. But even the (uniquely individuated) pre-sentient fetus is po-

tentially a person – and, obviously, it is *potentially* a sentient being. But it is widely appreciated that potential possession of a trait that confers some status does not by itself confer that status. The fact that I am potentially a senior citizen and am developing along a natural course that will eventually make me a senior citizen does not confer upon me whatever respect and special privileges senior citizens are due. It is transparently fallacious to argue from potential possession of a status-conferring trait to current possession of that status.³³

But there is another argument, which appeals implicitly to potential possession of certain valued experiences, which is not transparently fallacious. Indeed, this Future-Like-Ours Argument (FLOA), carefully developed by Donald Marquis, is widely regarded as the strongest moral argument against abortion.³⁴ Because the FLOA contends that pre-sentient fetuses have a right to life as soon as they come into existence, because we may come into existence before stem cells are extractable, and because stem cells cannot be extracted without killing the embryo, it is important for our purposes to confront this argument, which proceeds as follows.

Why is it wrong, in ordinary circumstances, to kill paradigm persons like you or me? The fundamental reason – perhaps among others – is that killing us would deprive us of valuable futures, which would include all of our personal projects, enjoyments, meaningful activities, and other experiences plausibly believed to make human life valuable (in ordinary circumstances). This account of the wrongness of killing explains why we regard killing persons as such a terrible crime; it also accommodates our belief that death ordinarily harms the person who dies. Meanwhile, it avoids certain difficulties of other leading accounts of the wrongness of killing persons, such as the desire-based account (which understands the wrongness of killing persons primarily as a matter of thwarting their desire to continue living).³⁵ Further, this approach plausibly implies that, since killing infants would (normally) deprive them of valuable futures – futures like ours – infanticide is (at least normally) wrong. By contrast, accounts that base the wrongness of killing persons on their special moral status as persons notoriously struggle to explain the commonsense conviction that infanticide is ordinarily wrong.³⁶

Now consider fetuses (using the term broadly to include any prenatal, uniquely individuated human organism). A human fetus is an individual that can ordinarily, if permitted to live, develop into a person who has the sorts of experiences we value so highly. So the fetus has a future like ours. Thus, abortion, like the killing of paradigm persons, is ordinarily wrong. This

is a substantial moral argument against abortion that requires no religious assumptions, avoids equivocation on the moral and descriptive senses of such terms as *human being* or *person*, and avoids other difficulties as just noted. Again, the FLOA is widely regarded as the strongest moral argument against abortion.

Without speculating as to how Marquis himself would view the ethics of embryo research, we can easily imagine the extension of his FLOA to these issues. Arguably, the embryos from which stem cells would be extracted are uniquely individuated, such that the logic of the FLOA applies to them: they too have futures like ours. But from this it would not follow that they have a right to life. The reason is not merely that they currently lack sentience. For we have not ruled out the

The harm of death for an infant seems intermediate between the harm of death for a person and the loss of value of someone's never coming into existence.

thesis that having a future of sentience and of more complex forms of consciousness suffices for a right to life. But I will argue that the FLOA is an oversimplified account of the ethics of killing human beings and that a more plausible account does not confer a right to life on pre-sentient fetuses.³⁷

Note that the FLOA makes a questionable value assumption. It assumes that numerical identity – being one and the same individual over time – is the sole basis for rational prudential concern, for determining what is in a being's interests, suggesting that evaluation of a fetus' future should assume a whole-lifetime perspective. From this perspective, abortion (or the destruction of uniquely individuated research embryos) entails an enormous loss, the loss of a valuable future – with no discounting of this loss. On the basis of this prudential claim, the FLOA infers that abortion is morally comparable to killing paradigm persons insofar as both acts deprive individuals of their valuable futures.

But from a whole-lifetime perspective, the younger one is, other things being equal, the more of a valuable future one loses from death. Thus, the FLOA's value assumption implies, strangely, that a pre-sentient fetus is harmed more by death than is an infant, who is harmed more by death than is a ten- or 25-year-old. But, as McMahan notes, precisely the opposite seems true: Other things equal, the ten- or 25-year-old loses more from death than does an infant, who loses more from death than a pre-sentient fetus loses.³⁸ This suggests that the harm of death is a function not only of lost opportunities for valuable future experiences – the point the

FLOA gets right – but also of the way in which one is psychologically “invested” in, or connected with, one's future. McMahan's Time-Relative Interest Account explains such judgments about the harm of death, and it can illuminate prenatal moral status.

The Time-Relative Interest Account discounts the importance of death to its victim, at the time of death, for any weakness in the psychological unity that would have connected the victim at that time with himself in the future. The degree of psychological unity in a life, or over a stretch of time, is a function of the richness, complexity, and coherence of the mental life that is carried forward over time. When the psychological unity that would have bound an individual at the time of death to himself in the future – had he lived – is weak, death matters less prudentially for that individual at that time. This suggests that a turtle's death does not prudentially matter very much to him, when he dies, because the turtle's mental life is psychologically not very unified over time.

However, one might wonder why, in assessing the harm of death, we should focus on a being's time-relative interest in remaining alive rather than the individual's interest as understood from a whole-lifetime perspective. The Time-Relative Interest Account asserts that where there is a major divergence between what is best for A from a whole-lifetime standpoint and what is in A's time-relative interests, we should favor the latter standard. Why? Because this account best explains certain comparative intuitions about the harm of death. It helps to explain why a person seems to lose much more from death than (for example) a turtle loses. It also provides the only plausible explanation of why death seems to harm an infant less than it harms a ten- or 25-year-old rather than vice versa. This point merits expansion.

The harm of death for an infant seems intermediate between the harm of death for a person and the loss of value of someone's never coming into existence.³⁹ A conception that never took place entails a loss of enormous possible future good, that of an ordinary human life, but without a victim, the loss is impersonal and therefore of little or no importance. When a person dies, the amount of good lost may well be less than in the nonconception case – since, having already lived some years, the person loses less than a lifetime – but there is a victim, the person. Equally importantly, the victim would have been psychologically deeply connected to herself in the future, had she lived. In the case of an infant's death, a great deal of good is lost – on average, more than a dying person loses – and there is a victim, unlike in the nonconception case. But the infant is psychologically only weakly related to herself in the

future. If psychological unity did not discount the loss to the victim, the infant would typically lose a good deal more than the ten- or 25-year old. Discounting the lost good in accordance with the Time-Relative Interest Account explains our judgments here.

Let us apply this account to the killing of pre-sentient fetuses. Very soon after conception, there is a human organism with a valuable future. This is what is right about the FLOA. But the utter lack of psychological unity between the pre-sentient fetus and the later sentient being or person it could become justifies a radical discounting of the harm of the fetus' death. For the proper basis for assessing the harm of death to the pre-sentient fetus is its time-relative interest in remaining alive. Either of two plausible ways of understanding this time-relative interest justifies a major discounting of the harm of death.

On the view I am inclined to accept, because the pre-sentient fetus is numerically identical to the later person, it has some (time-relative) interest in remaining alive, but its interest is very weak, much weaker than yours or mine, due to the absence of psychological unity. Another possibility within the biological approach is to drop the claim that bare identity (with psychological life only in the future) is a basis for prudential concern – in which case the pre-sentient fetus would have no interest in remaining alive. Intuitions are likely to clash about which prudential claim is more reasonable. Either way, even if the pre-sentient fetus had an interest in remaining alive, it would be too weak to ground a right to life, so societal interests in vital biomedical research could justify overriding the fetus's interest in remaining alive.

In addition to suggesting that the pre-sentient fetus lacks a right to life, the Time-Relative Interest Account, at least as I interpret and develop it, has broader implications for moral status. The account suggests that where there is significant weakness of psychological unity binding a being to itself in the future, prudential evaluation for that being should discount its interests in proportion to the decreased psychological unity. This would apply not only to the pre-sentient fetus's current interest in remaining alive, but to all of its current interests (again, assuming it has any): its interests in remaining in good health and having loving parents and eventually enjoying civil liberties, if it is brought to term. In sum, any interest that can be meaningfully attributed to the fetus is to be discounted. Such across-the-board discounting of its current interests suggests that its current moral status is less than a person's moral status. On the view I am developing, then, we come into being before we have full, or even very substantial, moral status. If I am on the right track, even if – contrary to my argument in the previous section

– we originate as single-cell zygotes, we do not have substantial moral status early in gestation.⁴⁰

I conclude that the reasoning underlying Bush's opposition to cloning-for-biomedical-research and his policy regarding ESC research is mistaken. Then again, we can't responsibly draw conclusions about public policy directly from an assessment of such reasoning. There are many other factors to consider: What is the role and significance of public funding for research? Where there is more than one fairly reasonable view about a topic, what authority does the most reasonable view – assuming we can identify it – have for public policy? What to do about a large minority's sensibilities (whether or not they are reasonable) if they would be deeply offended by a particular policy? Moreover, what should we make of the prospects of adult stem cell research, an uncontroversial alternative to ESC research? I certainly cannot address these questions here. However, I suggest that the President's approach to cloning-for-biomedical-research and ESC research will appear much less sustainable if, as I have argued, careful inspection reveals shaky foundations.

Acknowledgments

Embryonic versions of this paper were presented at the Pitts Memorial Lectureship at the Medical University of South Carolina on September 10, 2004 and for the Philosophy and Public Policy discussion series at the University of Maryland, College Park on December 10, 2004. I thank attendees of both sessions, especially Robert Lebel and Matthew Liao, for their feedback. Special thanks are also due to Alfonso Gomez-Lobo for independent discussions of these issues and to an anonymous reviewer.

References

1. G. W. Bush, Remarks on Stem Cell Research, The Bush Ranch, Crawford, TX, August 9, 2001.
2. G. W. Bush, "Stem Cell Science and the Preservation of Life," *New York Times*, August 12, 2001, at D 13.
3. President's Council on Bioethics, *Monitoring Stem Cell Research* (Washington, DC: PCB, 2004), Letter of Transmittal to the President of the United States: ix-xii, at x.
4. President's Council on Bioethics, *Human Cloning and Human Dignity: An Ethical Inquiry* (Washington, DC: PCB, 2002), Executive Summary: xxi-xxxix.
5. See, e.g., L. R. Baker, *Persons and Bodies* (Cambridge: Cambridge University Press, 2000).
6. See, e.g., D. DeGrazia, "Are we Essentially Persons? Olson, Baker, and a Reply," *Philosophical Forum* 33 (2002): 101-120; and D. DeGrazia, *Human Identity and Bioethics* (Cambridge: Cambridge University Press, 2005): chapter 2.
7. See, e.g., D. DeGrazia, *supra* note 6 (both works).
8. J. McMahan, *The Ethics of Killing: Problems at the Margins of Life* (New York: Oxford University Press, 2002): chapter 1.
9. See D. DeGrazia, *Human Identity and Bioethics*, *supra* note 6.
10. *Ibid.* For a prominent defense of this view, see E. T. Olson, *The Human Animal* (New York: Oxford University Press, 1997).
11. See, e.g., Pope John Paul II, "The Unspeakable Crime of Abortion," in *Evangelium Vitae*, encyclical letter of John Paul II, March 25, 1995 (Vatican City: Libreria Editrice Vaticana, 1995).
12. I say "virtually" because mutations can introduce minor differences between the two zygotes' DNA.
13. Here I make the standard assumption that identity is transitive: If A = B and B = C, then A = C.

14. I learned of the two competing models from Alfonso Gomez-Lobo.
15. See A. Gomez-Lobo, "On the Ethical Evaluation of Stem Cell Research: Remarks on a Paper by N. Knoepfler," *Kennedy Institute of Ethics Journal* 14 (2004): 75-80, at 79.
16. See, e.g., PCB, *supra* note 3, at 76-78.
17. A. Gomez-Lobo, *supra* note 15, at 78.
18. He writes that "...the chromosomes in the two pronuclei duplicate themselves separately, and then copies from each come together inside the actual nuclei formed after the first cell division. It is within each of the two nuclei present in the two-cell embryo that a complete set of forty-six human chromosomes commingle for the first time," L. Silver, *Remaking Eden* (New York: Avon, 1997): at 45.
19. *Ibid.*, at 58.
20. In this paragraph I have benefited greatly from L. Silver, *supra* note 18, at 58-63.
21. In principle, artificial, delayed twinning by way of cloning remains possible.
22. The claim is developed in A. Gomez-Lobo, "Sortals and Human Beginnings" (unpublished manuscript). Gomez-Lobo's citations include the two that follow.
23. H. Pearson, "Your Destiny from Day One," *Nature* (2002): 1-5.
24. N. Campbell, and J. Reece, *Biology*, 6th ed. (San Francisco: Benjamin Cummings, 2002): at 999.
25. L. Silver, *supra* note 18, at 50-51.
26. Earlier I said it has the potential to develop in a way that produces one of us, not that it has the potential to become one of us.
27. PCB, *supra* note 3, at 8.
28. Another exciting possibility is to clone ESCs from people with particular diseases in order to produce a limitless source of cells that can be used to study these diseases without having to extract tissue samples from patients. A. Coghlan, "UK Cloners Target Diabetes Cure," *New Scientist* (2004): 8-9.
29. Interestingly, the PCB recently recommended legislation that would prohibit "the use of human embryos in research beyond a designated stage in their development (between 10 and 14 days after fertilization)," President's Council on Bioethics, *Reproduction and Responsibility* (Washington, DC: PCB, 2004), Executive Summary: xxxix-xlix, at xlvi. While not condoning the use of research embryos prior to this point, the PCB left the matter open: "Some members of the Council are opposed to any experimentation that harms or destroys embryos, but, recognizing that it is legal and active, they see the value in limiting the practice" *Ibid.*
30. See, e.g., M. Sella, "The Human Embryo: A Scientist's Point of View," *Bioethics* 7 (1992): 135-140; J. A. Burgess and S. A. Tawia, "When Did You First Begin to Feel It? - Locating the Beginning of Human Consciousness," *Bioethics* 10 (1996): 1-26; J. Korein, "Ontogenesis of the Brain in the Human Organism: Definitions of Life and Death in the Human Being and Person," *Advances in Bioethics* 2 (1997): 20-31, at 25-26; and V. Glover and N. Fisk, "Fetal Pain: Implications for Research and Practice," *British Journal of Obstetrics and Gynaecology* 106 (1999): 881-886.
31. See, e.g., J. Feinberg, *Harm to Others* (Oxford: Oxford University Press, 1984); P. Singer, *Animal Liberation*, 2nd ed. (New York: Avon, 1990); and B. Steinbock, *Life Before Birth* (New York: Oxford University Press, 1992). For my development of this approach, see D. DeGrazia, *Taking Animals Seriously: Mental Life and Moral Status* (Cambridge: Cambridge University Press, 1996).
32. See, e.g., M. A. Warren, *Moral Status: Obligations to Persons and Other Living Things* (New York: Oxford University Press, 1997).
33. See, e.g., D. Boonin, *A Defense of Abortion* (Cambridge: Cambridge University Press, 2003): at 45-49.
34. D. Marquis, "Why Abortion is Immoral," *Journal of Philosophy* 86 (1989): 183-202.
35. *Ibid.*, at 195-196.
36. A prominent example is M. A. Warren, "On the Moral and Legal Status of Abortion," *The Monist* 57 (1973): 43-61.
37. I first developed this argument in D. DeGrazia, "Identity, Killing, and the Boundaries of Our Existence," *Philosophy and Public Affairs* 31 (2003): 413-442, at 432-434; and I develop it more fully in *Human Identity and Bioethics*, *supra* note 6, chapter 7.
38. McMahan, *supra* note 8, at 270-271.
39. McMahan develops this point very lucidly, *supra* note 8, at 170-171.
40. The present discussion should not be taken as even a rough sketch of my approach to the ethics of killing in general. My fuller view understands the ethics of killing not only in terms of the Time-Relative Interest Account for all beings with interests; it also includes a strong deontological presumption, grounded in respect for persons, against killing persons. Elsewhere I explain why I believe this framework does not have radical, intuitively unacceptable implications regarding infanticide. D. DeGrazia, *Human Identity and Bioethics*, *supra* note 6, at 290-293.