

Logical Fallacies in the Literature  
on Human Embryonic Stem Cell Research <sup>1</sup>

I intend to explore human embryonic stem cell research from a humanities viewpoint, specifically addressing logical fallacies in the literature which not only discusses but also approves of stem cells derived from abortions. While I recognize that logic is not specific only to the humanities, fallacies occur in argumentative and persuasive writing, both of which are typically the province of the humanities and, even more specifically, English professors. Much of the debate about human embryonic stem cell research involves not only the mere presentation of facts about the use of stem cells derived from abortions, but also the effort to persuade the public that such use is ethical. Certainly not all human embryonic stem cell research is fallacious, but I will focus on certain works which contain such errors in thinking. Thus, I trust that the research I will present can contribute a unique perspective to the purposes and needs not only of this conference, but also of the general public.

The goal of identifying, responding to, and correcting logical fallacies falls within the purview of English professors, for we academics have been given a serious commission: to encourage our students to write materials which are not only grammatically correct, but also logically correct. Higher education is keenly aware that most students lack critical thinking skills. I have perceived this lack among my own students over the past fourteen years, and I can testify to students' lack of critical thinking skills on controversial issues, such as the use of stem cells derived from abortions.

My methodology for this presentation consists of the following three items. First, since there is an extremely large body of literature on the subject of stem cells derived from abortions, I will review only recent scholarly and some popular literature (with a few exceptions, arbitrarily selecting 2000 as the beginning of my investigation). Second, I will focus on those monographs or anthologized works which address human embryonic stem cell research or which seem to address my particular concern, the logical formulations of ethical considerations used to support such research; thus, general works

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<sup>1</sup> Interested individuals may contact the author by email at [KolozzeJ@clarkstate.edu](mailto:KolozzeJ@clarkstate.edu) for a copy of the PowerPoint presentation which accompanied this paper, which was first presented before the inaugural Pro-Life Science and Technology Symposium held at the Engineers' Club in Dayton, Ohio on 1 May 2004. I wish to express my thanks to Dr. Robert Sweet of Clark State Community College for helpful comments regarding logic as he critiqued this paper. I thank Dr. Sweet for being patient with me as he explained finer points of logical fallacies. Any errors which may occur in this paper are to be attributed to my own ignorance. Some day I may have the fortune to achieve his intellectual level.

on the subject of stem cells were omitted as well as those few videographic sources produced since 2000. Third, I will review individual works in chronological order to determine what logical fallacies could impede the author's logic.

Since I intend to make this brief essay student-oriented, in all of the following analysis, I intend to work from the perspective of a contemporary student. What would he or she find in the literature on this subject? Would he or she be able to identify fallacies in arguments on the issue? What linguistic or rhetorical tools could he or she use to correct the fallacies found in the literature? Thus, to help our students, I will intersperse within the commentary on fallacies found in the various works linguistic and rhetorical ways to correct errors in thinking caused by such logical fallacies.

A general definition of "logical fallacy" must be given here. Logical fallacies are those errors in thinking which occur when rules of reasoning are not precisely followed.<sup>2</sup> Fallacies are classified into two general categories: formal fallacies are those involving the structure (or form) of the argument; informal fallacies are those which can be discerned through the content of the argument. If these two classifications are not complicated enough for some students, identifying fallacies may become difficult because contemporary college and university students are introduced to several sometimes differing taxonomies through the course of their education.<sup>3</sup> The taxonomy I follow will,

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<sup>2</sup> Ignorance per se is not a fallacy. For example, Robert Wachbroit writes in a 2003 essay:

If one believes, as many of the strongest opponents of abortion do, that "life begins at conception"--i.e., that from the very moment of conception we are dealing with something that has the moral status of a person--then the annual destruction of thousands of excess embryos should be at least as offensive as the destruction of presumably far fewer embryos from stem cell research. Perhaps this difference reflects an inconsistency and the antiabortion movement should include IVF centers in their protests. (79-80)

Instead of attacking him for this apparently ad hoministic statement (veiled in irony or sarcasm), perhaps one should be charitable and presume that Wachbroit is not aware that pro-life opposition to human lives destroyed by in vitro fertilization clinics is a constituent element of the pro-life position and that opposition to such killing could be achieved if the resources of the movement permitted.

<sup>3</sup> For example, two grammar and rhetoric textbooks widely used in colleges and universities offer not only divergent

hopefully, be familiar to those who are progressing through the baccalaureate program at least.

Charles Krauthammer, "Why Pro-Lifers Are Missing the Point" (2001)

Reprinted in a 2002 anthology of essays on genetics, Charles Krauthammer's essay, originally published in Time in 2001, illustrates the central failure of those who support human embryonic stem cell research: recognizing that obtaining such cells means killing human life. In this reasoned essay Krauthammer writes:

At immediate issue are "stem cells," cells often taken from the very earliest embryo [. . .] Pro-life forces find the procedure ethically impermissible, because removing the cells kills the embryo [. . .] But their arguments fail. First, stem cells are usually taken from embryos produced for in-vitro fertilization or from aborted fetuses.  
(201)

The fallacy here is ambiguity or unclear language. Ambiguity is acceptable in some aesthetic situations. Part of the delight that exists in literature is derived from the reader evaluating the ambiguous information presented to him or her so that he or she can reach a conclusion. In a typical murder mystery, for example, whether the butler committed the crime is weighed against the quantity of facts which seem to indicate that the heir to the family fortune committed the crime...or was it the maid? or the gardener? or was the murder really a suicide?

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taxonomies, but also differing registers of language within those taxonomies. Diana Hacker's The Bedford Handbook (2002, 6th ed.) identifies seven logical fallacies: the either/or fallacy (511), false analogy (508), hasty generalization (507), non sequitur (512), post hoc ergo propter hoc (510), straw man (516), and unfair emotional appeals (514). Sylvan Barnet and Hugo Bedau, editors of Current Issues and Enduring Questions: A Guide to Critical Thinking and Argument, with Readings (2002, 6th ed.), which has a much higher register of vocabulary, identify seventeen fallacies, only three of which are replicated in Hacker's work by the same term. Their seventeen fallacies are: ad hominem (322), ambiguity (318), appeal to authority (323), appeal to ignorance (325), composition (321), death by a thousand qualifications (318), division (321), equivocation (320), false dichotomy (either/or) (319), genetic fallacy (322), hasty generalization (320), many questions (318), oversimplification (319), poisoning the well (322), post hoc, ergo propter hoc (326), protecting the hypothesis (327), and slippery slope (324).

In moral positions, however, ambiguity obscures the possibility of reaching a conclusion. In itself, ambiguity is not fallacious; suggesting that a case is ambiguous when it is not, however, is.

Krauthammer is correct in saying that "removing the cells kills the embryo" but is incorrect in his reasoning when he writes that "stem cells are usually taken from embryos". Perhaps the issue here is one of semantics; it might be possible for such cells to be extracted without necessarily killing the embryo. However, given the current technology and practice involved in obtaining such cells, this semantic distinction must be made. "To kill" is not synonymous with "to take". This inability to distinguish between the verbs is further confusing because Krauthammer acknowledges that such stem cells can be obtained from two sources, "in-vitro fertilization or from aborted fetuses". The latter clearly identifies the means by which the cells are derived; unlike the incorrect use of the verb "take" with respect to "kill", the past participle "aborted" is synonymous with "killed". At least Krauthammer is consistent with his stated purpose. Although I consider the following statement a red herring fallacy, Krauthammer declares that "the real problem with research that manipulates early embryonic cells--whether derived from fetal tissue or from adult cells rejuvenated through cloning--is not the cells' origin but their destiny" (202).<sup>4</sup>

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<sup>4</sup> I found it interesting that the Geron Ethics Advisory Board argues against the "moral status" of the unborn child by suggesting that the mere existence of divergent views supports the ambiguity inherent in deciding the moral issue of human embryonic stem cell research. (Although this document falls two years before my arbitrary cut off of 2000, I include it here since it was reprinted in a 2003 monograph.) When discussing whether the blastocyst has "moral status", the Ethics Advisory Board suggested in its 1998 "Statement on Human Embryonic Stem Cells" that

This question has riveted political, religious, and ethical attention, and profound and substantial disagreement is based not only on contending biological interpretations but also on deeply held philosophical and theological considerations. Some have argued for conception as the relevant consideration, others for the development of the "primitive streak" (the precursor to the spinal cord of an individual fetus) as a defining moment, and some for utilizing implantation as the crucial threshold for moral status [. . . .] Drawing upon this wealth of philosophical and theological reflections and situating

Venkatachari Jagannathan Dronamraju, Biological Wealth & Other Essays (2002)

The following is how Venkatachari Jagannathan Dronamraju, president of the Foundation for Genetic Research, answers the question posed by the section title, "Stem Cell Research: Which Way to Go?":

Powerful lobbies in Washington and the nation have been debating the pros and cons of allowing stem cell research to go forward [. . .] The debate is being carried on at several levels--theological, ethical, political and scientific. For a scientist, the decision is fairly simple. If the research is scientifically sound and is likely to yield beneficial results, then one must go forward with the project [. . .] However, anti-abortion forces argue that research should be restricted to adult stem cells, which can be harvested without destroying embryonic life. On the other hand, some conservatives in the Republican Party favor research using human embryos. They include Senator Orrin Hatch of Utah, the ranking Republican on the Senate Judiciary Committee[,] and Senator Connie Mack, a Roman Catholic, of Florida. (116-7)

Unfortunately, the answer leaves the author open to one charge of oversimplification, one charge of non sequitur, and three charges of ad hominem.

Perhaps Dronamraju need not be faulted for saying that "the

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ourselves relative to it, the EAB affirmed our understanding of moral status as developmental and consonant with the pluralistic approach. (109-10)

For those interested in comparison, this language approximates that used by the United States Supreme Court in its Roe v. Wade ruling which legalized abortion throughout the nine months of pregnancy. The Supreme Court's attempt to argue that the mere existence of divergent opinions on the beginning of human life somehow points to inherent ambiguity is now well-known as feeble. The Ethics Advisory Board, similarly, bases its support for human embryonic stem cell research by noting that, although "[a] second source of cells is human embryonic germ (hEG) cells derived from gamete ridge tissue removed from early fetal tissue following elective abortion", it "cannot resolve the contentious abortion debate" (Geron 111).

decision [regarding human embryonic stem cell research] is fairly simple"; after all, pro-life scientists would argue that there is no controversy. Dronamraju's statement, though, supposes that the world of the scientist is divorced from the other three categories which are identified. This demarcation could be an oversimplification, the name of the fallacy which generalizes what would be complicated steps in an argument or the reality of the world. Should or can a "scientist" necessarily abandon his or her "theological, ethical, [or] political" identities when faced with the issue of human embryonic stem cell research? I suggest not and will leave the elaboration of the arguing that a scientist must have an informed conscience to other professionals.

The "if...then" proposition following this oversimplification, however, is particularly troublesome since it involves the non sequitur fallacy. Non sequitur, Latin for "it does not follow", can be determined if a conclusion does not logically proceed from the application of a major and a minor premise. The correlative terms "if...then" can be used to specify a series of propositions used in deductive or inductive reasoning. Expanding this "if...then" proposition, one could conclude that the major premise of Dronamraju's conditional statement is that the research must be scientifically sound. No problem here; one does not add a drop of water to a container of potassium, but rather a bit of potassium to a container of water. The second conditional statement is not preceded by the subordinating conjunction "if", but the omission is accounted for by the rule of ellipsis. Beneficial results may come from any "scientifically sound" procedure, but those results may conflict with ethical, financial, legal, moral, or spiritual considerations. Dronamraju would have readers ignore such considerations completely, for the conclusion which is given after these two conditional clauses are juxtaposed (the "then" conclusion to these conditional statements) is ineluctable: "one must go forward with the project" (116; emphasis added).

Dronamraju makes his position unworthy of attention, however, by the three ad hominem attacks which conclude this passage. Ad hominem, Latin for "against the person", is the name of the fallacy identifying an attack against the individual him- or herself instead of an attack against what he or she thinks or says. The first ad hominem involves the use of "anti-abortion". Calling opponents of human embryonic stem cell research "anti-abortion" is fallacious for two reasons. First, some opponents may not be identified with the pro-life movement at all. Second, since many opponents are pro-life, their opposition is grounded on a consistent ethic which respects life from the moment of fertilization to death--thus including two other life issues, infanticide and euthanasia, and to disregard their concern for these other two issues marginalizes their comprehensive position. Calling a pro-lifer "anti-abortion" is simply insulting, since it does not reference the other major issues of concern to the pro-

life community.<sup>5</sup>

The remaining two ad hominem attacks are easily challenged. Saying that "some conservatives in the Republican Party favor research" implies that opposition to human embryonic stem cell research is primarily the province of "conservative" persons--and not merely conservatives, but Republican conservatives. Finally, Dronamraju must think it is necessary to attack Roman Catholic opposition to human embryonic stem cell research, noting that even "Senator Connie Mack, a Roman Catholic, of Florida" supports "research using human embryos" (117). Why is this apposition necessary? What does it do to advance the argument about human embryonic stem cell research? Since it does not embellish the argument either for or against the research, then the apposition is as useless as it is inappropriate and should be omitted. The attack against Roman Catholics is the more interesting because Senator Hatch's religious persuasion is not noted.<sup>6</sup>

Hwa A. Lim, Genetically Yours: Bioinforming, Biopharming, Biofarming (2002)

The fallacy of hasty generalization occurs when conclusions are drawn from insufficient data. Contemporary students can identify this fallacy often by linguistic markers. For example, it would be correct to say that "All humans will die", for it is our experience that no human lives eternally on his or her own power; we experience the death of those near to us and have learned through study that death is the natural denouement of life. It would be incorrect, however, to say that "All English professors admire Eminem" since there may be at least one professor who may not admire the rapper. One must remember that it is not the conclusion that signals a hasty generalization, but rather the premises which may state conditions which are inappropriately worded, making it improbable for one to draw a conclusion. Thus, the use of the word "all" is too inclusive and linguistically marks a use of the hasty generalization logical fallacy. Similarly, words such as "each", "every", and even "virtually all" may help students identify cases where this

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<sup>5</sup> At least Charles Krauthammer, who supports human embryonic stem cell research, does use the correct term "pro-lifers" in his essay.

<sup>6</sup> It is possible to refer to divergent political opinion without engaging in ad hominem attacks. Marcia (Marti) A. Lewis and Carol D. Tamparo refer to such opposition in an appropriately neutral sentence in their 2002 monograph, Medical Law, Ethics, and Bioethics for Ambulatory Care: "Many pro-life politicians see [human embryonic stem cell research] as a positive outcome of a negative act [. . . .]" (178).

fallacy is used.

Sometimes, however, such linguistic markers are absent, making the task of identification a complicated one. This is the case in Genetically Yours, a 2002 work by Hwa A. Lim, who, among his other qualifications, has vested interests in companies which would be affected by stem cell legislation. Lim states that opposition to President Bush's ban on human embryonic stem cell research came from four groups, one of which is the "[r]eligious group", for "This group, which believes stem cell research should be banned completely, views the decision compromises [sic] the sanctity of life" (192). Lim does not consider that there might be at least one religious group that does not object to stem cell research per se. (In fact, I cannot think of any religious group that has issued such a comprehensive and absolutist statement opposing such research.) Religious groups do, however, take issue with stem cell research derived from abortions.<sup>7</sup>

Lewis D. Solomon, The Jewish Tradition, Sexuality, and Procreation (2002)

Lewis D. Solomon writes about the Jewish perspective on human embryonic stem cells in his 2002 monograph The Jewish Tradition, Sexuality and Procreation. Although several fallacies can be identified in this work, the ones I will discuss here are ambiguity (leading to dehumanization) and unfair emotional appeal.

Almost immediately, the reader is aware of ambiguity in language. Solomon writes about the unborn child in terms which are certainly ambiguous and, thus, dehumanizing.<sup>8</sup> Discussing

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<sup>7</sup> Interestingly, Steve Usdin noted recently in a 2003 essay that "The United Methodist Church, which has affirmed a woman's right to elective abortion, objects to the derivation of stem cells from embryos" (7).

<sup>8</sup> Lest this sound like a non sequitur, consider other categories of humans who have been stripped of their humanity by the use of ambiguous terminology and thus were reduced to non-human entities. The research of William Brennan in his seminal 1995 monograph Dehumanizing the Vulnerable: When Word Games Take Lives has assisted scholars in understanding this principle for the past decade. Brennan writes, "Removal of individuals from membership in the human community and re-classifying them as animals has the effect of consigning them to a lower level of existence where their victimization can be more easily rationalized" (89). After this dehumanization occurs, of course, anything can then be done to the dehumanized entity. African-American slaves during the nineteenth century in the United States were dehumanized in a variety of "work animal" metaphors (95). Jews during the Nazi era were dehumanized as "beasts of

embryos created by in vitro fertilization techniques, Solomon writes that

An embryo put into the deep freeze typically consists of about one or two hundred cells, each of these cells containing all the information needed to start a unique genetic existence. Researchers take stem cells from a frozen embryo, four to seven days after fertilization, when it is a hollow sphere consisting of one or two hundred cells.

(208-9)

The dehumanizing effect of these words should be obvious. We are not speaking of an unborn human being here, but "about one or two hundred cells"; furthermore, the cells do not so much continue the process that began after fertilization as that they merely constitute "all the information needed to start a unique genetic existence" (emphasis added). This is equivalent to saying that the Jeff Koloze of the year 2005 does not exist yet, but that what you see before you now in 2004 has all the requirements for the genetic existence that will occur next year. This, of course, is true. My 2005 existence has not yet occurred. Does that mean, however, that my humanity is now in question? It could be, of course, if I do not meet the criteria that some people use in defining humanity.

Now, on to the logical fallacy of unfair emotional appeal which can be found in Solomon's work. Sometimes it is appropriate to use an emotional appeal. Think of the typical fundraising letters or television commercials that illustrate for you the reader or the viewer the plight of children who do not have enough to eat in poor countries. Appealing to our emotions satisfies one of the three factors used in persuasive writing--pathos. Sometimes, however, an emotional appeal can be inappropriate if the use of the emotional appeal obscures the two other aspects of persuasive writing which could have advanced the argument better: logos, the logical factor, and ethos, the factor concerned with the credibility of the speaker.

Solomon's use of unfair emotional appeal is (paradoxically) complex in its brevity. He devotes an extensive paragraph--about 150 words--to the advantages of the use of stem cells. No one would contest that; stem cells do have great medical potential. However, Solomon reduces opposition to stem cells derived from abortions to one sentence. Solomon writes, "Experimentation with embryonic stem cells, obtained from spare human embryos, lacking any fetuslike features, slated for destruction at fertility clinics, remains controversial in the United States" (209).

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prey" (93). Unborn children today are similarly dehumanized as "a form of lower animal" (180), or as the being behind "the 'disease' of an unwanted pregnancy" (114; internal quotes in original), or as subhuman (77).

Grammatically, this sentence attempts to counter any objection to stem cells derived from aborted or discarded embryos by inserting three participial phrases between the subject and the predicate of the sentence.

Why is noting this mere fact of grammar important? We are all familiar with the universal syntax of English sentence structure, usually denoted as the N-V-N (or noun-verb-noun) pattern. That is, when anyone speaks, he or she identifies the subject (the first N), then what that subject did (the verb), and finally, if applicable, what object received the action of the verb (combined, the verb and the second noun constitute the predicate). For example, "All Democrats should vote for George W. Bush". When an author breaks or interrupts that standard syntax, immediate attention is given to the words, phrases, or clauses which break the usual flow of words, granting them as much importance as what the normal syntax would communicate.

Solomon could have simply written "Experimentation with embryonic stem cells remains controversial in the United States", which would have been an unobjectionable attempt to denote the current conflict. The interpolation of the three--note, not one, not two, but three--participial phrases between the subject and the predicate draws immediate attention away from the controversy to the ideas being communicated in those participial phrases.

Moreover, the emotional distance is increased by the physical distance between the subject and predicate, especially since the words in the phrases are not so much denotative as they are highly connotative. The term "spare" implies a positive connotation generally ("spare" indicating something which is beyond necessity and almost optional) but in this case implies that the human lives are expendable. The connotations of the combined terms "lacking any fetuslike features" eliminates any moral qualms which may be generated by technological advances which show the facial features and other body parts of the unborn, making them much more "personable". Finally, the negative connotation of the term "slated" would suggest to someone considering donating his or her embryos from a fertility clinic that the course of action is ineluctable anyway, thus obviating any moral qualm about participating in the act of killing (an act of killing that, interestingly, "someone else" at the fertility clinic would do, thus removing individual responsibility for the killing from the mother or father her- or himself). In fact, Solomon does not even admit that stem cells can be derived from abortions but only acknowledges those surplus embryos obtained from fertility clinics.<sup>9</sup>

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<sup>9</sup> Solomon's collapse of the moral objections starkly contrasts against the extensive recognition of pro-life objection to stem cells derived from abortions by Audrey R. Chapman, Mark S. Frankel, and Michele S. Garfinkel in their 2000 statement "Stem Cell Research and Applications: Monitoring the Frontiers of Biomedical Research" (published in the 2000 yearbook of the

Richard Cohen, "Embryonic Stem Cell Research Will Save Lives" (2003)

Richard Cohen's 2001 essay "Embryonic Stem Cell Research Will Save Lives" is certainly not as scholarly as other works, but I think that his ideas must be mentioned here for at least three reasons. First, the original essay "An Ethical Travesty" was printed in The Washington Post in 2001; having been printed in a national newspaper of note thus guarantees wide circulation of his statements. Second, since this essay has been reprinted in one of the Opposing Viewpoints monographs, students are exposed to his statements--and the fallacies therein--to a greater degree.<sup>10</sup> Finally, Cohen's statements manifest

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American Association for the Advancement of Science). While the authors consider embryos from fertility clinics to be "disposable" ("Embryonic stem cells should be obtained from embryos remaining from infertility procedures"), they also declare that

Human stem cell research can be conducted in a fully ethical manner, but it is true that the extraction of embryonic stem cells from the inner mass of blastocysts raises ethical questions for those who consider the intentional loss of embryonic life by intentional means to be morally wrong. Likewise, the derivation of embryonic germ cells from the gonadal tissue of aborted fetuses is problematic for those who oppose abortion [. . . .] Public funding should be provided for embryonic stem cell and embryonic germ cell research, but not at this time for activities involved in the isolation of embryonic stem cells, about which there remains continuing debate [. . . .] Although the derivation of human stem cells can be done in an ethical manner, there is enough objection to the process of deriving stem cells to consider recommending against its public funding. (411)

<sup>10</sup> Greenhaven Press publishes a series called Opposing Viewpoints, each volume including pro and con essays on contemporary social issues. Based on my experience with students in community colleges and universities and, more importantly, on the opinions of librarians who have guided my research paper students in library orientation programs, the Opposing Viewpoints titles are considered reliable sources of information for essays which discuss social problems. The handy volumes may be a

numerous fallacies which are sometimes difficult to identify. I intend to elaborate on the one instance each of bandwagon, fallacy of many questions, and red herring; two instances each of ad hominem and hasty generalization; three instances of equivocation or ambiguous language; and three instances of the either/or fallacy--thirteen fallacies within the space of a three-page excerpt.

Bandwagon is the name of the fallacy which implies that all members of a group either are or should do a certain action or believe a certain thing. Cohen begins one paragraph with an apparently innocuous sentence: "Anyone can see that, ultimately, stem cell research and the related field of cloning are going to produce ethical questions galore" (127). While one would hope that such a controversy over human embryonic stem cell research need not exist, this is not a perfect world, for some people may not yet have achieved a pro-life perspective. However, the bandwagon effect is suggested by the sentence that follows: "But the one that exists at the moment is entirely manufactured--the product of calling an embryo a 'human being'" (127; internal quotes in original). At first glance this might seem more ad hoministic--ad hominem being the fallacy of attacking those who hold a contrary view themselves instead of attacking their ideas. What constitutes this as bandwagon, though, is its grammatical connection, the use of the coordinating conjunction "but". Perhaps Cohen meant to use the conjunctive adverb "however", which is popularly confused with the coordinating conjunction. As written here, however, the second sentence, preceded by the coordinating conjunction "but", suggests a unified compound-complex sentence which merely happens to be divided into two physical sentences. The first sentence seeks to acknowledge something that "everybody" should know; the second sentence seems to imply that "everybody" should similarly know that "the one [ethical question] that exists at the moment is entirely manufactured". This second statement is patently erroneous. Some people have based their objection to human embryonic stem cell research on ethical, moral, or religious principles. This fact of the opposition to embryonic stem cell research is what should be believed by "everybody", not that it is "manufactured"--itself a highly negative connotative word, implying that some

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student's first source of information on controversial matters, especially if an instructor demands that the student cite a number of authorities to argue his or her case. The volumes, being anthologies, admirably meet this criterion. In fact, the companion website for the Opposing Viewpoints series may provide even greater access for students to essays within the volumes. Published by the Gale Group, this internet-based service, accessible to students through their colleges' libraries, provides the full texts of many articles published since 1980.

people just got together one day and "made it up". <sup>11</sup>

As mentioned earlier, ad hominem is the Latin name for the fallacy involving a personal attack on one's opponent instead of an attack on his or her position. I can locate two instances of ad hominem in this excerpt of Cohen's. The first instance is doubly devious because it is not only an attack against the individual (President Bush) but also a clever and demeaning use of punctuation. Cohen writes,

[I]t is at that very stage in the process-- the mere production of a fertilized egg--that George W. Bush and his fellow "pro-lifers" declare that a "human being" has been created, a term Bush himself has used in reference to mere embryos, particularly those created by cloning. (127; internal quotes in original)

Cohen attacks President Bush's ban on human embryonic stem cell research throughout the essay; this is not fallacious and is the province of good argumentative writing. Cohen's attack on the individual, however, is not justifiable.

It is interesting that Cohen felt the need to place the politically-correct term to denote those who support the first civil right to life in quotation marks. Let's consider the popular use of quotation marks. When someone wants to draw attention to what he or she is verbalizing, then that person will

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<sup>11</sup> The two remaining single instances of logical fallacies are the fallacy of many questions and red herring. The fallacy of many questions, which suggests that there are unanswered questions or unsupported claims embedded within what seems to be one proposition, is evident in one compact sentence: "In the purported cause of forbidding others from playing God, Bush and like-minded people would themselves play God" (Cohen 129). This one sentence can be exploded with a barrage of epistemological questions which demand to be answered. How does Cohen know that pro-lifers have the goal of "forbidding others from playing God"? How does Cohen know that this is the "cause" of pro-lifers? How does Cohen know that Bush wants to play God? How does Cohen know that "like-minded people" want to "play God"?

The red herring fallacy suggests that one is trying to divert attention from the matter at hand by alluding or referring to another, sometimes completely unrelated matter. Cohen does so by diverting attention from discussing the morality of using human embryonic stem cells to claiming that opponents know "what God intended" (128). This is also the case when Cohen attacks President Bush for being privy to a similar divine enlightenment. Both of these cases are instances of the red herring diversionary tactic, for, when one is debating the morality of stem cells, one need not erroneously suggest that an opponent's position is based on a speculative and private divine revelation.

make quotation marks with his or her index and middle finger while speaking. For example, if I say, "John Kerry says he is 'Catholic'" and use my fingers to put quotation marks in the air while I'm uttering the word "Catholic", then I am drawing attention to a belief that Kerry's Catholicism can be seriously questioned, because of his refusal to support the first civil right to life. In fact, when people gesture like this, they invariably do so to belittle what was said--the classic "He said [with a tonal emphasis on the verb "said"] that he was [the term to be disparaged is inserted here]". Scholars call such an accompanying action an "illustrator" (a gesture which reinforces a verbal message) (Pearson and Nelson 29). Using quotes around the term "pro-lifers" is not meant to be denotative as much as it is meant to be demeaning. Similarly, the quotes around "human being" seem to belittle the position that President Bush and "pro-lifers" hold that the embryo is a human life. While it would have been proper for Cohen to have argued against this position, the attack on the people themselves who believe this is unnecessary and fallacious.

This is Cohen's second instance of ad hominem:

[W]e get stuck with a kind of awful determinism, embracing as "human" embryos that nature ordinarily rejects. The pro-lifers would even overrule nature itself, insisting that anything moving through the birth canal is a human being and thus inviolate. They know, somehow, that this is what God intended [. . . .] (128; internal quotes in original)

Is it necessary to malign pro-lifers' views in the two ways done above: that we "overrule nature" and that we know the mind of God? Instead of showing why pro-life views are inaccurate, Cohen disparages our beliefs as those of persons who are not only ignorant of the balances in nature but also theocratic zealots.

There are two instances of hasty generalization worth discussion. One instance will be discussed further below within the context of another fallacy, so I will focus on the remaining one here. Cohen writes,

Common sense would at least suggest that we are entitled to do what nature itself does all the time. Yet, by fiat based on religious belief, the president has decided to severely limit stem cell research funded by the government and maybe even conducted by private industry as well. (129)

The hasty generalization should be obvious here. President Bush did not merely base his decision on "religious belief", yet Cohen attempts to designate the religious perspective on human embryonic stem cell research as the exclusive basis for the decision protecting the lives of human embryos. In fact, the connotation of the term "fiat" reinforces the perception that

Cohen wants people to have that the decision is a purely religious one. That is as erroneous as saying that all pro-lifers are pro-life because they are religious, when the truth is that some people may have come to the pro-life viewpoint from objective study (as Bernard Nathanson did, who was attracted to the pro-life view from his fetological studies while he was still agnostic).<sup>12</sup>

Equivocation is the name given to the fallacy where terms are used interchangeably and in an inappropriate way; the resulting ambiguity may confuse the reader and impede his or her comprehension of the logic being presented. As mentioned above in the discussion surrounding the Geron Ethics Advisory Board's statement, ambiguous language may not per se be fallacious (much creative literature is dependent on a stealthy use of an ambiguous term), but ambiguity should be avoided if one is arguing a certain position. Cohen's essay demonstrates the fallacy of equivocation when he uses the term "egg" in two different senses. Describing the process of fertilization in low register colloquial language, Cohen writes, "A sperm is swimming like crazy toward the egg. It makes contact and fertilizes it. The egg then moves up the tube so that it can attach itself to the wall of the womb" (127). However, this reduction of the process of fertilization and implantation obscures the logical fallacy contained therein. In the beginning of this brief passage of process analysis writing, the term "egg" is used accurately at first to denote the ovum. After fertilization occurs, however, one no longer has an "egg"; one has a blastocyst or any one of the other technical terms which denote the entity created by the fusion of sperm and ovum. The depersonalization of the new human being is accomplished further by the uses of the neuter third person pronoun "it" and the neuter reflexive pronoun "itself" when, to be politically correct, Cohen should have used "he" or "she" and "himself" or "herself".<sup>13</sup>

Finally, I note three instances of the either/or fallacy. This fallacy is often marked explicitly by the use of the correlative conjunctions "either...or", either together or singly. Often, however, the possibility of identifying this

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<sup>12</sup> The first sentence of Cohen's above quote also illustrates the non sequitur fallacy. "Nature" does many things "all the time". Some in the animal kingdom kill their newborn, but it does not follow, just because a male cat will kill a newborn kitten, that "Nature" will "suggest" to human fathers not only that they could kill their newborn children but also that they "are entitled to do" so.

<sup>13</sup> The two remaining uses of ambiguous language are relatively easy to identify. Cohen speaks of "embryos" or "mere embryos" as though they are not the same as "'human beings'" (internal quotes in original) in two locations (127, 129).

fallacy is not as linguistically clear as finding those terms. The first instance worth mentioning confuses categories that pro-lifers have been familiar with for years, life versus potentiality. Cohen writes, "if the process [of a human being "progressing from the embryo stage to the fetus stage"] is interrupted, which is more the rule than the exception in nature, then we do not have life. We had merely the potential for it" (127). Cohen rehearses the tired divisions used by anti-lifers of the categories "life" and "potentiality", which division is inapplicable in the circumstance of embryonic stem cell research. The blastocyst, the embryo, and the fetus are all merely names given to different stages of life which is actual. This instance of the fallacy is especially interesting because, usually, when critics point out the use of either/or fallacy, they demand that the categories offered by an author should be expanded. That is, if someone argues that there are only two solutions to a problem, the either/or fallacy may obtain, especially if one can point to a third solution. In this case, the use of the "life" and "potentiality" division is a fallacious use of either/or because the categories should be collapsed into the one category which is applicable: life per se.

In the second instance of the either/or fallacy, Cohen asks, Who could have thought that back when most of us took sides [on the abortion issue], some of us would have wound up defending late-term abortions on the one hand while others would denounce stem cell research? In both cases, principle has thoroughly trashed common sense. (129)

He needlessly omits two other alternatives, probably to protect his own hypothesis. When people in the 1960s and later were taking sides on the abortion issue, they probably divided themselves into three main categories, as Dr. Ray Adamek's sociological studies on the characteristics of activists on both sides of the abortion issue have consistently documented. That is, one can be pro-life, anti-life, or a member of the "mushy middle" supporting abortion only under certain circumstances. When Cohen wrote this essay (2001), the three major divisions still applied. Moreover, one can argue that within these three divisions are further gradations: one who can be identified as anti-life may be so only because he or she supports abortion in the first trimester or only for reasons of failed birth control. Most importantly, however, a counter argument can be made against the two categories that Cohen proposes. Popular opinion is not divided into two camps of pro-partial birth abortion and con-stem cell research. Some supporters of partial birth abortion may not support stem cell research and vice versa. Similarly, there may be some who call themselves pro-lifers who may even support human embryonic stem cell research. Reducing the many divisions of thought on the matter to these two categories obscures the many nuances that people must contend with to adequately persuade

others of the correctness of their position.

Cohen's third and final use of either/or fallacy is a summary statement that has a significant equivocation as well. "In the end, it's possible that human beings may die so that embryos will live" (Cohen 129).<sup>14</sup> Here is the basest form of the opposition which some people tend to make between those who are born who have diseases which may be alleviated or cured by stem cell research and those who are unborn who may be a source for stem cells to help those who are born. In Cohen's estimation, then, a third possibility is completely ignored; those who are born do not have to die, and the unborn do not have to be killed, since stem cells can be obtained from other sources which do not necessitate the killing of the unborn.<sup>15</sup> Moreover, one can question why these two categories are necessarily in competition. Why can't the needs of both groups of people be met--to service the health needs of those born and to guarantee that the life interests of the unborn are protected? This third possibility is an option that only pro-lifers, it seems, promote, since they do not see the unborn child as an antagonist to someone already born.

William Gentry, "The Morality of Using 'Surplus' Human Embryos in Stem Cell Research" (accessed 15 April 2004)

The final essay which occupies the balance of this paper is William Gentry's online article "The Morality of Using 'Surplus' Human Embryos in Stem Cell Research".<sup>16</sup> While there is much that can be pointed out in this interesting essay, I will restrict my comments to a severe case of ambiguity and a good or bad syllogism.

I have discussed Cohen's concern about religious language above, and it seems that William Gentry, emeritus professor of

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<sup>14</sup> This is the sentence that the editors use as an attention getter to head the essay (126).

<sup>15</sup> I highly recommend that interested individuals consult the website of the Center for Bioethics and Human Dignity at [cbhd.org](http://cbhd.org) and subscribe to weekly email notices. The Center frequently carries summaries of recent research showing that stem cells derived from sources other than abortions have greater research potential and practical use.

<sup>16</sup> The URL indicates that Gentry's paper was produced for what appears to be the "2001-02" academic year. Keeping to the chronological ordering of my review of the literature, I conclude this essay with Gentry's article since, thanks to the immediacy of the internet, the chronology of this undated online article will always be current until the site carries an update.

philosophy, is another scholar who is just as concerned or confused (or deliberately seeking a religious terminology or influence when it isn't there) as Cohen is. Gentry writes that

Many opponents base their conviction on religious dogma instead of on scientific discovery or philosophical reasoning. They see no need to provide rational justification for their belief about the essential nature of the human embryo. They are likely to say that they "believe" their conviction is true rather than that they have arrived at their conclusion as the culmination of a process of sound reasoning. (internal quotes in original)

Unfortunately, Gentry's attack on Patrick Lee and Robert P. George whom he quotes earlier in his article shows a surprising application of the semantic gymnastics that we are accustomed to see when anti-lifers discuss abortion. Gentry quotes Lee and George: "*People of every religious persuasion, or none at all, ought to be able to see that . . . the things that we are, are human physical organisms*" (italics in original), but then Gentry makes the impermissible logical leap in semantics that the use of "see" in the passage "in this rhetorical usage is equivalent to 'believe'", neglecting another entirely obvious possibility, that the verb infinitive "to see" in Standard American English also conveys the meaning of the verb infinitive "to understand". Thus, Gentry tries to force Lee and George's text to his own purposes rather than to understand the simple grammar of the verb used. It is inappropriate to consider that the idea of the verb infinitive "to see" (as in "to understand") is equivalent with the verb infinitive "to believe". At best, Gentry could have speculated such an equivalency but should not have made the linguistic leap that he did. Perhaps Gentry, attempting to document only a religious influence in the passage, was protecting his own hypothesis by not considering the obvious alternative meaning.

Another important part of Gentry's article which can be discussed here illustrates a faulty syllogism. The syllogism is perhaps the workhorse of argumentation, the vehicle by which different propositions, called premises, can be juxtaposed so that a conclusion can be reached. Most students are aware of the famous textbook example:

Major premise: All human beings are mortal.

Minor premise: Socrates is a human being.

Conclusion: Socrates is mortal. <sup>17</sup>

This syllogism concludes accurately because the major premise, which usually enunciates an abstract and general principle, is

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<sup>17</sup> This "classic example" can be found in Barnet and Bedau (67).

correct in all cases. The minor premise, which usually enunciates something about a specific example, is considered true. When the premises are juxtaposed, one is ineluctably led to the conclusion that Socrates, who is part of the category "human beings", has one of the specific attributes of that category, mortality, so one can safely assert, which is to say logically conclude, that Socrates is mortal like any other human being.

Sometimes, the juxtaposition of the premises can lead to an incorrect conclusion, such as the following.

Major premise: All birds sing.

If one did not know how to challenge the specific terms in this premise, or if one had no knowledge of birds that do not "sing", then one must grant that this is true.

Minor premise: Eminem sings rap songs.

Although one may have a doubt about whether rap involves singing as much as it does verbal presentation, we can acknowledge that Eminem has chosen to be a performer of contemporary music.

Conclusion: Eminem is a bird.

The conclusion is incorrect, and this syllogism is considered faulty. Eminem is not a bird, but a talented human being. Where did the conclusion go wrong? One can point to the obvious hasty generalization in the major premise; not "all" birds "sing". Does a penguin "sing" as much as it utters another sound? Do ostriches "sing"? Of course, the criticism of the major premise may seem like quibbling over words, but then that is exactly the point. Understanding the denotative value of words is crucial in argument. Thus, the verb "sing" may be inappropriate to denote the activity which penguins and ostriches do.

Gentry's syllogistic reasoning is especially faulty at one point in his article because it involves similar hasty generalization and inappropriate use of language. Gentry traces the pro-life logic of respect for unborn human life in the following, what he calls, "syllogistic pattern":

Premise 1: Whatever possesses human biological components is essentially a human being.

Premise 2: All human embryos, even those excess embryos fabricated in clinical fertility efforts, possess human biological components.

Conclusion and Premise 1a: All human embryos are essentially innocent human beings.

Premise 2a: To kill any innocent human being is murder.

Conclusion: To kill a human embryo is murder.

Just as the example of the faulty syllogism involving Eminem was dissected by analyzing the constituent premises and terminology, here too we can determine where the language has proven fatal to this syllogism. First, of course, the obvious

equations in the various premises can be attacked. His Premise 1 "Whatever possesses human biological components" is equated by use of the present tense verb with "essentially a human being". This premise, presumably a major one since it seeks to declare an abstract, universal truth, is hasty generalization because of its all-inclusive terminology to which we can find examples to counter its validity. A fingernail "possesses human biological components" (whatever "human biological components" means--mere DNA or some other factor unstated), but it is illogical to place that fingernail in an equivalent category called "human being" in the sense that the latter phrase is customarily used.<sup>18</sup>

Similarly, another inappropriate equation can be found in his Premise 2a. The verb infinitive "to kill" cannot be equated with the stronger connotation verb "murder"--not so much on the mere point that a verb infinitive cannot be equated with a noun form, but that "to murder" implies three constituent elements which must satisfy the legal definition which distinguishes killing or manslaughter from murder. To murder, one must know that the act is wrong, have full consent of the will, and perform the deed. Thus, as much as anti-life thinking would like to paint pro-lifers as those who equate abortion and murder, unless the conditions were met, the premise is false. By the same

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<sup>18</sup> It is difficult for me to determine whether the language of this and subsequent premises in Gentry's work is merely hasty generalization or a more complex sequence of logical fallacies without more detailed analysis of his work. Barnet and Bedau discuss the fallacy of composition (not covered elsewhere in this paper) which may apply here. "The fallacy of composition [...] is called [such] because the reasoning commits the error of arguing from the true premise that each member of a group has a certain property to the not necessarily true conclusion that the group (the composition) itself has the property" (321). That fallacy could apply here, if we consider that Gentry is identifying the "human biological components" as the requisite "certain property" that he holds "a human being" to have. As I have discussed, though, the qualities (or properties) of a fingernail are not necessarily the qualities or properties of a human being him- or herself.

Arthur Lueders writes about another fallacy, the sorites fallacy, which he defines in terms which make it seem as though the error in thinking can be attributed solely to grammatical elements: "The Sorites Fallacy is an argument consisting of propositions so arranged that the predicate of any one forms the subject of the next and the conclusion unites the subject of the first proposition with the predicate of the last". This methodology could apply as Gentry's series of premises and conclusions is followed. Perhaps the difficulty in identifying the fallacy can be accounted for by different taxonomies as discussed earlier in this paper.

reasoning, his terminal Conclusion is illogical because it fails to make the linguistic difference between "killing" and "murder".

Perhaps, though, since he is trying to formulate the pro-life view toward unborn human life, Gentry should not be faulted so severely. He does attempt to proceed logically to define the pro-life view; if certain items were corrected, the syllogism could be improved to convince others that stem cells should not be derived from embryos because of their inherent value as human beings.

### Summary

My intention in this paper has been to convey the idea not only that discussion of errors in thinking on human embryonic stem cell research is an important and neglected element of the debate, but also that a remedy to those errors can be found in linguistic analysis of those fallacies. It can be intimidating to debate scholars and writers who seem to make a case for human embryonic stem cell research. Seeming, however, is not being, and I believe that, with even the most rudimentary education in logical fallacies, today's students can determine for themselves whether someone has argued his or her case well or not. A common theme in literature which supports human embryonic stem cell research is that the technology should be implemented merely because it is available. It should be obvious that merely saying that one can do something does not mean necessarily that one must do something. However, given the state of critical thinking in the West, particularly in American society, what I have just said may itself be a hasty generalization. Today's students, who may be educated more by ideologues motivated by political correctivity than by professors seeking truth, need to know that an alternative voice to the use of human embryonic stem cell research exists.

I encourage those students to challenge those who have contorted an essentially life-affirming technological process into a function of an anti-life worldview. Much more work needs to be done to combat the errors in reasoning which some use to attack unborn life as a source of stem cells. Since this paper only reviews selected literature from 2000 onward, I ask that students and professors who are more competent or confident in argumentation and linguistics will accept the challenge to develop further the corpus of literature which examines the logical fallacies in human embryonic stem cell research. I hope that this paper has contributed to that effort.

## Works Cited

- Adamek, Ray. "What America Really Thinks About Abortion." Ts. 1 May 2004.
- Barnet, Sylvan, and Hugo Bedau, eds. Current Issues and Enduring Questions: A Guide to Critical Thinking and Argument, with Readings. 6th ed. Boston: Bedford/St. Martin's, 2002.
- Brennan, William. Dehumanizing the Vulnerable: When Word Games Take Lives. Chicago: Loyola UP, 1995.
- Chapman, Audrey R., Mark S. Frankel, and Michele S. Garfinkel. "Stem Cell Research and Applications: Monitoring the Frontiers of Biomedical Research." AAAS Science and Technology Policy Yearbook: 2000. Eds. Albert H. Teich, Stephen D. Nelson, Celia McEnaney, and Stephen J. Lita. Washington, DC: Committee on Science, Engineering, and Public Policy, American Association for the Advancement of Science, 2000. 405-16.
- Cohen, Richard. "Embryonic Stem Cell Research Will Save Lives." Medicine: Opposing Viewpoints. Laura K. Egenorf. Opposing Viewpoints Series. San Diego: Greenhaven Press, 2003. 126-9.
- Dronamraju, K. R. [Venkatachari Jagannathan]. Biological Wealth & Other Essays. Singapore: World Scientific, 2002.
- Gentry, William. "The Morality of Using 'Surplus' Human Embryos in Stem Cell Research." Academic Forum Online. 15 Apr. 2004 <<http://www.hsu.edu/faculty/afo/2001-02/gentry.htm>>.
- Geron Ethics Advisory Board. "Research with Embryonic Stem Cells." The Stem Cell Controversy: Debating the Issues. Eds. Michael Ruse and Christopher A. Pynes. Amherst, NY: Prometheus Books, 2003. 107-19.
- Hacker, Diana. The Bedford Handbook. 6th ed. Boston: Bedford/St. Martin's, 2002.
- Krauthammer, Charles. "Why Pro-Lifers Are Missing the Point." The Future Is Now: America Confronts the New Genetics. Eds. William Kristol and Eric Cohen. Lanham, MD: Rowman & Littlefield, 2002. 201-3.
- Lewis, Marcia A. Medical Law, Ethics, and Bioethics for Ambulatory Care. Eds. Marcia (Marti) A. Lewis and Carol D. Tamparo. 5th ed. Philadelphia: F.A. Davis, 2002.
- Lim, Hwa A. Genetically Yours: Bioinforming, Biopharming, Biofarming. River Edge, NJ: World Scientific, 2002.
- Lueders, Arthur. "The Sorites Fallacy." Stem Cells & Cloning Club. 10 Sept. 2001. 24 Feb. 2004 <<http://www.stemcellsclub.com/SCCC-homesite/homepage/luedersarticle.html>>.
- Pearson, Judy C., and Paul E. Nelson. An Introduction to Human Communication: Understanding and Sharing. 8th ed. New York: McGraw-Hill, 2000.
- Solomon, Lewis D. The Jewish Tradition, Sexuality, and Procreation. Lanham: UP of America, 2002.
- Usdin, Steve. "Ethical Issues Associated with Pluripotent Stem Cells." Human Embryonic Stem Cells. Eds. Arlene Chiu and

- Mahendra S. Rao. Totowa, NJ: Humana Press, 2003. 3-25.
- Wachbroit, Robert. "Stem Cell Research and the Legacy of Abortion." Genetic Prospects: Essays on Biotechnology, Ethics, and Public Policy. Ed. Verna V. Gehring. Institute for Philosophy and Public Policy Studies. Lanham: Rowman & Littlefield, 2003. 75-84.

#### Works Consulted

- Adashi, Eli Y., ed. What's New in Reproductive Endocrinology? Exercise in Pregnancy. Ed. Raul Artal. Clinical Obstetrics and Gynecology 46.2 (June 2003). Philadelphia: Lippincott Williams & Wilkins, 2003.
- Beauchamp, Tom L., and LeRoy Walters, eds. Contemporary Issues in Bioethics. 6th ed. Belmont, CA: Thompson/Wadsworth, 2003.
- Canadian Institutes of Health Research. Ad Hoc Working Group on Stem Cell Research. Human Stem Cell Research: Opportunities for Health and Ethical Perspectives: a Discussion Paper. Ottawa: Canadian Institutes of Health Research, 2001.
- Committee on the Biological and Biomedical Applications of Stem Cell Research, Board on Life Sciences, National Research Council, Board on Neuroscience and Behavioral Health, Institute of Medicine. Stem Cells and the Future of Regenerative Medicine. Washington, DC: National Academy P, 2002.
- Davis, Dena S. "Informed Consent for Stem Cell Research in the Public Sector." JAMWA 55.5 (fall 2000): 270-4.
- Ficarra, Bernard J. Bioethics' Rise, Decline, and Fall. Lanham, MD: UP of America, 2002.
- Holland, Suzanne, Karen Lebacqz, and Laurie Zoloth, eds. The Human Embryonic Stem Cell Debate: Science, Ethics, and Public Policy. Cambridge, Mass.: MIT Press, 2001.
- Hurley, Patrick J. A Concise Introduction to Logic. 8th ed. Belmont, CA: Wadsworth/Thomson Learning, 2003.
- International Conference on "The Great Jubilee and the Culture of Life" (Cambridge, England: 2000). Culture of Life—Culture of Death: Proceedings of the International Conference on "the Great Jubilee and the Culture of Life." Ed. Luke Gormally. London: Linacre Centre, 2002.
- Kass, Leon R. Life, Liberty and the Defense of Dignity: The Challenge for Bioethics. San Francisco: Encounter Books, 2002.
- Kilner, John F., C. Christopher Hook, and Diann B. Uustal, eds. Cutting-Edge Bioethics: a Christian Exploration of Technologies and Trends. Horizons in Bioethics Series. Grand Rapids: William B. Eerdmans, 2002.
- Levine, Carol, ed. Taking Sides: Clashing Views on Controversial Bioethical Issues. 10th ed. Guilford, Conn.: McGraw Hill/Dushkin Pub. Group, 2004.
- Magill, Gerard, ed. Genetics and Ethics: An Interdisciplinary

- Study. St. Louis: Saint Louis UP, 2004.
- Magnus, David, Arthur Caplan, and Glenn McGee, eds. Who Owns Life? Amherst, NY: Prometheus Books, 2002.
- Martin, John V., ed. Patents: Issues and Legal Developments. Hauppauge, NY: Nova Science Publishers, 2002.
- Merrick, Janna C., and Robert H. Blank, eds. Reproductive Issues in America: A Reference Handbook. Contemporary World Issues. Santa Barbara: ABC-CLIO, 2003.
- Sherlock, Richard, and John D. Morrey, eds. Ethical Issues in Biotechnology. Lanham: Rowman & Littlefield, 2002.
- Smith, Wesley J. Culture of Death: The Assault on Medical Ethics in America. San Francisco: Encounter Books, 2000.
- Steinbock, Bonnie, John D. Arras, and Alex John London, eds. Ethical Issues in Modern Medicine. 6th ed. Boston: McGraw-Hill, 2003.
- Stonebarger, Bill. Stem Cells. Videorecording. Madison, WI: Hawkhill Associates, 2002.
- Teich, Albert H., ed. Technology and the Future. 9th ed. Belmont, CA: Wadsworth/Thomson, 2003.
- United States. Congress. House. Committee on Government Reform. Subcommittee on Criminal Justice, Drug Policy, and Human Resources. Opportunities and Advancements in Stem Cell Research: Hearing Before the Subcommittee on Criminal Justice, Drug Policy, and Human Resources of the Committee on Government Reform, House of Representatives, One Hundred Seventh Congress, First Session, July 17, 2001. Washington: U.S. G.P.O., 2002.
- United States. Congress. Senate. Committee on Appropriations. Subcommittee on Departments of Labor, Health and Human Services, Education, and Related Agencies. Status of the Implementation of the Federal Stem Cell Research Policy: Hearing Before a Subcommittee of the Committee on Appropriations, United States Senate, One Hundred Seventh Congress, Second Session, Special Hearing, September 25, 2002, Washington DC. Washington: U.S. G.P.O., 2003.
- . Stem Cell Research: Hearings Before a Subcommittee of the Committee on Appropriations, United States Senate, One Hundred Fifth Congress, Second Session, Special Hearing, December 2, 1998, Washington DC, January 12, 1999, Washington DC, January 26, 1999, Washington DC. Washington: U.S. G.P.O., 1999-2001.
- United States. Congress. Senate. Committee on Health, Education, Labor, and Pensions. The Dangers of Cloning and the Promise of Regenerative Medicine: Hearing Before the Committee on Health, Education, Labor, and Pensions, United States Senate, One Hundred Seventh Congress, Second Session, on Examining Cloning Research, Focusing on the Clarification of How Stem Cell Research, or Therapeutic Cloning, Differs from Human Reproductive Cloning, and the Ethical and Public-Policy Issues Related to Both, and Related Issues of S. 1853 to Ban Human Cloning While Protecting Stem Cell

- Research, March 5, 2002. Washington: U.S. G.P.O., 2002.
- . Stem Cell Research: Hearing of the Committee on Health, Education, Labor, and Pensions, United States Senate, One Hundred Seventh Congress, First Session on Examining the Scientific and Ethical Implications of Stem Cell Research and Its Potential to Improve Human Health, September 5, 2001. Washington: U.S. G.P.O., 2002.
- United States. Executive Office of the President. Ethical Issues in Human Stem Cell Research, Vol. 2, Commissioned Papers, Executive Office of the President January 2000. Washington: US GPO, [2000].
- Van Overwalle, Gertrude. Study on the Patenting of Inventions Related to Human Stem Cell Research. Luxembourg: Office for Official Publications of the European Communities, 2002.
- Waters, Brent, and Ronald Cole-Turner, eds. God and the Embryo: Religious Voices on Stem Cells and Cloning. Washington, DC: Georgetown UP, 2003.