

Deleting Trauma: A Christian Response to Memory-Editing Technologies and the Crisis in Human Identity Formation

Micah E. Chung

New Orleans Baptist Theological Seminary

Abstract: *Given the rise of “memory-modifying technologies” (MMTs) that promise to dampen, erase, and even replace unwanted memories, I explore in this paper a Christian response to MMTs given the crisis they bring to human identity formation. I first trace a history of memory models to answer the question, “What is memory?” informed by philosophy (Aristotle’s “Wax Seal” and Augustine’s “Vast Storehouse”), psychology (the “Information-Processor” model), and neuroscience (the “Spider Web” model). I then take Miroslav Volf’s The End of Memory as a Christian theological guideline to glean insights to develop a Christian response to MMTs, specifically those targeting memory erasure. I employ these insights to draw out implications for MMTs regarding personal and communal formation from a Christian perspective, centering the discussion on the Christian virtues of mercy, justice, godliness, and love.*

Key Words: *bioethics, corporate memory, identity, memory, memory-modification, regulative memories, technology, theology, virtue*

In the 1997 film, *Men in Black*, government agents use gadgets called “neuralizers” to erase and edit witnesses’ memories.¹ Though current neuroscience has yet to come close to such science fiction, the field of memory editing has advanced rapidly over the last two decades, yielding frighteningly provocative results that have given rise to “memory-modifying technologies” (MMTs).² MMTs hold promise “to dampen (via pharmacologicals), disassociate (via electro-convulsive therapy), erase (via deep brain stimulation), and replace (via false memory creation) unsavory episodic memories [and] are no longer the subject of science fiction. They

have already arrived.”³ Besides counseling methods that seek to employ the brain’s inbuilt self-editing mechanisms,⁴ current MMTs fit into four categories: (1) optogenetics, which uses lasers on the brain;⁵ (2) epigenetics, which directly manipulates brain molecules and proteins;⁶ (3) false memory therapy (FMT), which plants false memories to alter behavior;⁷ and (4) pharmacological treatments, which dampen or enhance memory through drugs.⁸ MMTs have successfully manipulated the memories of

³ DePergola II, “The Neurostructure of Morality,” 199.

⁴ Cf. J. M. Lampinen and T. N. Odegard, “Memory Editing Mechanisms,” *Memory* 14.6 (2006): 652; E. Phelps and S. G. Hofmann, “Memory Editing from Science Fiction to Clinical Practice,” *Nature* 572 (August 2019): 43–50; Kara N. Moore, et al., “Children’s Use of Memory Editing Strategies to Reject Source Misinformation,” *Child Development* 89.1 (2018): 219–34; and Jennifer A. Bell, “Preventing Post-Traumatic Stress Disorder or Pathologizing Bad Memories?” *American Journal of Bioethics* 7.9 (September 2007): 29–30.

⁵ For more on optogenetics, see Boston University, “How to Enhance or Suppress Memories: Stimulating Different Parts of the Brain Can Dial Up or Down a Specific Memory’s Emotional Oomph,” *ScienceDaily* (May 23, 2019), accessed April 15, 2020, https://www.sciencedaily.com/releases/2019/05/19052314_3040.htm.

⁶ For more on epigenetics, see J. M. Levenson and David Sweatt, “Epigenetic Mechanisms in Memory Formation,” *Nature Reviews Neuroscience* (January 14, 2005), accessed April 15, 2020, <https://www.nature.com/articles/nrn1604>; Johannes Gräff, et al., “Epigenetic Priming of Memory Updating During Reconsolidation to Attenuate Remote Fear Memories,” *Cell* 156.1–2 (January 2014): 261–76.

⁷ For more on false memory therapy (FMT), see Robert A. Nash, et al., “Public Attitudes on the Ethics of Deceptively Planting False Memories to Motivate Healthy Behavior,” *Applied Cognitive Psychology* 30 (2016): 885–97; James M. Lampinen, et al., “Compelling Untruths: Content Borrowing and Vivid False Memories,” *Journal of Experimental Psychology* 31.5 (2005): 594–63.

⁸ For more on pharmacological treatments, see Phelps and Hofmann, “Memory Editing,” 43–50; S. Matthew Liao and David T. Wasserman, “Neuroethical Concerns about Moderating Traumatic Memories,” *American Journal of Bioethics* 7.9 (September 2007): 38–40; Ana Galarza Vallejo, et al., “Propofol-induced Deep Sedation Reduces Emotional Episodic Memory Reconsolidation in Humans,” *Science Advances* 5 (March 20, 2019): 1–9; and Evelyn M. Tenenbaum and Brian Reese, “Memory-Altering Drugs: Shifting the Paradigm of Informed Consent,” *The American Journal of Bioethics* 7.9 (2007): 40–42.

¹ Barry Sonnenfeld, dir., *Men in Black* (New York: Columbia Pictures, 1997).

² Cf. S. Matthew Liao and Anders Sandberg, “The Normativity of Memory Modification,” *Neuroethics* 1 (2008): 85–99; and Peter A. DePergola II, “The Neurostructure of Morality and the Hubris of Memory Manipulation,” *The New Bioethics* 24.3 (2018): 199–227.

mice,⁹ and tests have now commenced on human subjects.¹⁰ These tests seem to show “that memories can be edited long after a memory is initially learned ... [a]lthough targeting human reconsolidation appears to modify but not erase memories.”¹¹ Researchers express confidence that “it may soon be possible to intervene in the memory systems [of humans] in very specific ways to affect their function and contents.”¹²

The use of MMTs on humans raises major ethical issues that can go beyond the usual scope of bioethics. In addition to the standard “issues of safety, efficacy, informed consent, and access, new developments in neuroscience [like MMTs] raise issues of privacy, confidentiality, enhancement, assuagement and social control.”¹³ In short, MMTs carry huge implications for both individual and communal identity formation.

In light of these concerns, I explore in this paper the implications of MMTs for identity formation from a Christian ethical perspective. I first look to history to answer the question, “What is memory?” informed by philosophy, psychology, and neuroscience. I then use Miroslav Volf’s *The End of Memory* as a theological guideline that surveys two biblical events closely tied to memory—Israel’s Exodus and Christ’s Passion—to glean insights for developing a Christian ethical perspective on memory and MMTs, specifically MMTs targeting memory erasure. Finally, I employ these insights to draw out implications for MMTs regarding individual and communal formation, centering the discussion on the Christian virtues of mercy, justice, godliness, and love.

What Is Memory? A Brief History

In the history of memory study, four major models have prevailed: (1) the wax seal (Aristotle); (2) the vast storehouse (Augustine); (3) the information processor (modern psychologists); and (4) the spider web (modern neuroscientists).

⁹ Cf. Fikri Birey, “Memories Can Be Edited,” *Scientific American* (May 13, 2014), accessed April 15, 2020, <https://www.scientificamerican.com/article/memories-can-be-edited>; Boston University, “How to Enhance or Suppress Memories”; Sarah Gibbens, “Memories Can Be Altered in Mice. Are Humans Next?” National Geographic Online (July 16, 2018), accessed April 15, 2020, <https://www.nationalgeographic.com.au/science/memories-can-be-altered-in-mice-are-humans-next.aspx>.

¹⁰ Cf. Elizabeth A. Phelps and Stefan G. Hofmann, “Memory Editing from Science Fiction to Clinical Practice,” *Nature* 572 (August 2019): 46.

¹¹ Phelps and Hofmann, “Memory Editing,” 47.

¹² Liao and Sandberg, “The Normativity of Memory Modification,” 85.

¹³ Henry, et al., “Propranolol and the Prevention of Post-Traumatic Stress Disorder,” 12.

Aristotle’s Wax Seal

Aristotle (384–323 BCE) offers the first known analysis of memory in his *De Memoria et Reminiscentia*.¹⁴ He conceives of memory as a kind of “imprint” left upon the “wax” of a soul by the “signet” of a sense experience.¹⁵ This “down-to-earth” conception of memory runs counter to his teacher, Plato, whose idea of memory is as “a mnemonic recollection of another reality.... [Aristotle instead] maintains that only objects of past perception can be objects of memory and that only such objects can be recalled.”¹⁶ In other words, only objects from direct sense experience can leave imprints, or mental images, that then serve as memory. Aristotle’s model thus stresses physicality and movement, which influence his distinction between memory and recollection. Whereas memory involves objects moving to impress upon the soul, recollection involves a mental movement within the soul toward a “reinstatement in consciousness of something which was there before but had disappeared.”¹⁷ In other words, a person recollects by having a thought that then “jumpstarts” a mental movement to “reach for” the memory.¹⁸ This “reaching” consists of an actual inward, physical movement.¹⁹

Augustine’s Vast Storehouse

After Aristotle, “[n]o other ancient author provides a comparable systematic reflection on memory and time”²⁰ until Augustine of Hippo (354–430 CE). Augustine only briefly mentions memory in *On the Trinity*,²¹ but Book X of his *Confessions* remains one of the most profound reflections on memory ever written. In *Confessions*, Augustine likens memory to “a field or a spacious palace, a storehouse for countless images of all kinds which are conveyed to it by the senses.”²² This spacious “storehouse for countless images of all kinds” also contains non-images as well, such as

¹⁴ Aristotle, *De Memoria et Reminiscentia*, in *Aristotle on Memory*, trans. Richard Sorabji (London: Gerald Duckworth & Company, 1972), 449b4–453b7.

¹⁵ Aristotle, *De Memoria*, 450a25 (emphasis added).

¹⁶ Samuel Byrskog, “Philosophical Aspects on Memory: Aristotle, Augustine and Bultmann,” in *Social Memory and Social Identity in the Study of Early Judaism and Early Christianity*, ed. S. Byrskog, R. Hakola, and J. M. Jokiranta (Bristol, CT: Vandenhoeck & Ruprecht, 2016), 28.

¹⁷ Aristotle, *De Memoria*, 451a18; cf. Byrskog, “Philosophical Aspects,” 27.

¹⁸ Aristotle, *De Memoria*, 451b29; cf. 452a30.

¹⁹ Cf. Aristotle, *De Memoria*, 453a14, 31.

²⁰ Byrskog, “Philosophical Aspects,” 26.

²¹ Cf. Augustine, *On the Trinity*, in *Nicene and Post-Nicene Fathers*, vol. 3, ed. P. Schaff (Peabody, MA: Hendrickson, 2004), X.11–12.

²² Augustine of Hippo, *Confessions* (Baltimore, MD: Penguin, 1971), X.8.5.

skills, thoughts, and feelings.²³ Quite ahead of his time, Augustine anticipates that memories are preserved not in narrative wholes but in separate categories within the mind: “In the memory everything is preserved separately, according to its category.”²⁴

Augustine also ties memory to questions of identity: “What, then, am I, my God? What is my nature? ... The wide plains of my memory and its innumerable caverns and hollows are full beyond compute of countless things of all kinds.”²⁵ He thus sees memory as “central to the self and the sense of personal identity.”²⁶ In Augustine’s words, “In it I meet myself as well.”²⁷

Psychology’s Information Processor

The advent of computers in the late twentieth century prompted a replacement of Augustine’s Vast Storehouse model with a new “information processor” model. Likening a computer processor to the human brain, this model divides memory into three distinct processes: encoding, which translates information into a storable form; storage, which is a physiological change in the brain that consolidates and stores the encoded information; and retrieval, which recalls the stored information for present use.²⁸

This processor model also comes with advantages and liabilities. It helps bring attention to the brain as a complex processor that “takes in,

²³ Cf. Augustine, *Confessions*, X.9.5, 14.5.

²⁴ Augustine, *Confessions*, X.8.17, 17.26.

²⁵ Augustine, *Confessions*, X.17.26; cf. Paula Fredriksen, “Augustine on God and Memory,” Boston University Website, accessed March 21, 2020, <http://www.bu.edu/religion/files/pdf/Augustine-on-God-and-Memory.pdf>.

²⁶ Byrskog, “Philosophical Aspects,” 33.

²⁷ Augustine, *Confessions*, X.8.25.

²⁸ Cf. S. E. Wood, E. G. Wood, and D. Boyd, *The World of Psychology*, 6th ed. (Boston, MA: Pearson Education, 2008), 198; and Beck and Demarest, *The Human Person*, 267. In this model, memory goes through three stages: Sensory memory (information that is perceived by the senses and lasts for only milliseconds), short-term memory (STM, or working memory), and long-term memory (LTM). LTM itself consists of two types: declarative memory (which manifests as episodic or semantic memory), and nondeclarative memory (which is difficult to verbalize and manifests as procedural memory). Episodic memory is memory of experiences themselves, or “the conscious recollection of life events” (Phelps and Hofmann, “Memory Editing,” 43). Semantic memory is “memory of the facts regarding the events” (Liao and Sandberg, “The Normativity of Memory Modification,” 94). Procedural memory describes “habitual knowledge such as walking, riding a bicycle, tying shoelaces” (Beck and Demarest, *The Human Person*, 268).

modifies, stores, and acts on information.”²⁹ However, we now know “that the brain retrieves information in bits and pieces and reconstructs them into a unified memory unlike the operations of a computer ... we do not store material by address as does a computer, and the computer model [also] does not allow for errors that are an inevitable part of the human memory system.”³⁰ Thus, this model has recently lost currency.³¹

Neuroscience’s Spider Web

To neuroscientists, a memory “looks more like a web in the brain than a single spot.”³² In other words, memories are not stored in a single place in the brain, but “[w]e know from brain imaging and from assessment of brain damage that we store various kinds of nondeclarative memory in different parts of the brain.”³³ When a memory is created, “it includes all the visual, auditory, and tactile inputs that make an experience memorable, and brain cells are encoded from all of those regions.”³⁴ Also like a web, memories are more effectively encoded when incoming data is attached to as many other categories of memory as possible.³⁵ Moreover, retrieval is made much more effective “when we use the same cues to retrieve that we used to encode and when we utilize the original context of material we are trying to locate,”³⁶ much like following the interconnected lines of a web until we retrace and recapture the memory.

This model thus highlights memory’s intricacy, interactivity, and coordination, emphasizing how memory is not simple but complex, not singular but composite.³⁷ So while it is common to speak of “storing” memory, “memories are not spatially localized [but] spread across different structures, likely as distributed networks of potentiated synapses.”³⁸ Each memory “is stored inside a unique *combination* of brain cells that contain all the environmental and emotional information associated with that

²⁹ Klatzky, *Memory and Awareness*, 15.

³⁰ Beck and Demarest, *The Human Person*, 267.

³¹ Beck and Demarest, *The Human Person*, 267.

³² Gibbens, “Memories Can Be Altered in Mice.”

³³ Beck and Demarest, *The Human Person*, 268–69.

³⁴ Gibbens, “Memories Can Be Altered in Mice.” One can hear echoes of Augustine’s “different categories” here.

³⁵ Beck and Demarest, *The Human Person*, 269.

³⁶ Beck and Demarest, *The Human Person*, 269. This idea seems reminiscent of Aristotle’s motion-oriented concept of recollection.

³⁷ Filloux, *Memory and Forgetting*, 48; cf. Phelps and Hofmann, “Memory Editing,” 43.

³⁸ Liao and Sandberg, “The Normativity of Memory Modification,” 87.

memory.”³⁹

Defining Memory

These models teach us much about memory. From Aristotle, we learn to see memory as physical motion, which can now be translated neuroscientifically as the movement of memory cues across a vast web of neuronal synapses to recollect desired information or events from the past. From Augustine, we learn to see memory as a diverse collection of separate categories, not just images, and as a faculty mysteriously connected to shaping personal identity. The information processing model shows us that memory displays an overwhelming complexity that far surpasses the simple input-output functionality of computers. Finally, neuroscience’s spider web model highlights that memory displays the beautifully intricate interconnectedness within a multifarious array of specialized systems.

Memory, then, can be defined as a multifaceted web of interconnected mental systems that encodes, stores, and recalls reproductions of past information, experiences, feelings, and skills in a way that shapes one’s identity. Such a definition immediately carries serious ethical implications. As possessors of such a complex apparatus of diverse memory structures, human beings should exercise extreme caution when tampering with their memory using MMTs.

Memory, Theology, and Identity Formation

Miroslav Volf’s *The End of Memory* provides a helpful theological take on memory.⁴⁰ In chapter six, Volf centers his discussion on two definitive memories—Israel’s Exodus and Christ’s Passion—as “regulative memories” for the people of God,⁴¹ memories that define and regulate the very identities of the communities that remember them: “To be a Jew is to remember the Exodus. To be a Christian is to remember the death and resurrection of Christ... [T]ake away the memories of the Exodus and Passion, and you will have excised the pulsating heart that energizes and directs their actions and forms their hopes.”⁴² Volf’s study of these two regulative memories thus yields valuable insights to inform a Christian ethic regarding MMTs.

³⁹ Boston University, “How to Enhance or Suppress Memories” (emphasis added).

⁴⁰ Miroslav Volf, *The End of Memory: Remembering Rightly in a Violent World* (Grand Rapids: Eerdmans, 2006).

⁴¹ Cf. Volf, *The End of Memory*, 94.

⁴² Volf, *The End of Memory*, 97 (emphasis original).

Lessons from Israel’s Exodus

Israel’s Exodus from Egypt stands as the definitive event of God’s salvation in the Old Testament, and the biblical text makes unmistakably clear that such a foundational memory carries decisive ethical implications (cf. Exod 22:21–22; Deut 10:18–19; 24:17–18). Volf sees two such injunctions: “The first is that of *deliverance*: Act in favor of the weak and oppressed just as God acted in your favor when you were weak and oppressed. The second is the lesson of unbending retributive *justice*: Oppose oppressors and punish them just as God opposed and punished those who have oppressed you.”⁴³ So Israelites must “free their compatriot slaves and always treat kindly all aliens in their midst,”⁴⁴ but also punish oppressors like Amalek “with the cruelest of punishments: the extermination of its people and the obliteration of all memory of them.”⁴⁵ The Exodus memory thus “teaches not only merciful protection of the weak and afflicted but also severe punishment of violent afflictors”⁴⁶ so as to reflect God. In short, this memory leads us toward mercy, justice, and God-centeredness.

Lessons from Christ’s Passion

Such mercy, justice, and God-centeredness reflects even more extensively in Christ’s Passion (His death and resurrection). Like the Exodus, the Passion displays God’s deliverance of the oppressed, but now God shows that His mercy “extends to every human being.”⁴⁷ As for justice, the Passion shows God “shouldering the wrongdoing done to sufferers ... God identifies it truthfully and condemns it justly.”⁴⁸ Through the Passion memory, God gives Christians the strength to “honor victims even while extending grace to perpetrators.”⁴⁹ More than that, God gives Christians the strength to reconcile with those who have wronged them,⁵⁰ thus enabling the “*formation of a reconciled community even out of deadly enemies.*”⁵¹ Thus, the Passion memory not only highlights mercy, justice, and God-

⁴³ Volf, *The End of Memory*, 107–8.

⁴⁴ Volf, *The End of Memory*, 107.

⁴⁵ Volf, *The End of Memory*, 107; cf. Deut. 25:17–19.

⁴⁶ Volf, *The End of Memory*, 107.

⁴⁷ Volf, *The End of Memory*, 118.

⁴⁸ Volf, *The End of Memory*, 118.

⁴⁹ Volf, *The End of Memory*, 118.

⁵⁰ Volf, *The End of Memory*, 118–19.

⁵¹ Volf, *The End of Memory*, 119.

centeredness but enables forgiveness, reconciliation, and communion between enemies.⁵²

Theological Summary

Volf's theological reflection on the Exodus and the Passion reveals profound insights. The Exodus memory calls for deliverance of the oppressed, justice against the oppressor, and focus on God. The Passion memory reinforces these emphases but adds the ethical imperative and ability to seek forgiveness, reconciliation, and communion even between enemies. Christian theology, then, has much to add to memory's definition by specifying *how one's identity should be shaped based upon one's memory of God's past deliverance*. Christian theology thus insists on an *ethical* component to memory that shapes a particular kind of identity that is *merciful* to the oppressed, *just* against the oppressor, *centered* on God, *forgiving* of the wrongdoer, and *reconciliatory* toward the enemy. In other words, God wants our memories to make us people of mercy, justice, godliness, and love. So to answer the question, "Should people use MMTs?" requires answering a deeper question: "Do MMTs help or hinder us in shaping our identities and communities into those of mercy, justice, godliness, and love?"

A Christian Identity-Based Evaluation of MMTs

I now use the Christian identity-based virtues of mercy, justice, godliness, and love to evaluate MMTs. Because of space limitations, I concentrate on MMTs used for memory erasure.

Mercy

At first glance, MMTs seem to promise mercy to sufferers, especially those agonizing under PTSD. Recent studies show that "about one out of every 13 people in the US will have PTSD at some point in their lives," making the managing of such traumas "a medical priority."⁵³ Thus, doctors might consider it merciful to administer a pharmacological MMT like propranolol in order to help a sufferer "forget" a debilitating memory and live without such a "strong emotional response to painful recollections."⁵⁴ Another potential mercy might be for those with memories of being rejected or abandoned and who thus feel unlovable.⁵⁵ MMTs might allow them to forget that initial abandonment and offer them an opportunity to

⁵² See Volf, *The End of Memory*, 121–22.

⁵³ Birey, "Memories Can Be Edited."

⁵⁴ Gibbens, "Memories Can Be Altered in Mice."

⁵⁵ Cf. Phelps, et al., "Memory Editing," 47.

develop new, love-receptive automatic thoughts that foster healthy self-care.

However, "just like in the movies, we may find that if we succeed in easily editing human memories, there could be unexpected consequences for how we think about memory and its role in defining who we are."⁵⁶ Such "unexpected consequences" seem more than likely to arise because of the very nature of memory as an interconnected web: Plucking one or more strings of the web might change the entire set of structures in unforeseen and dangerous ways.

Though a few PTSD sufferers may experience a sense of mercy, these MMTs very likely would make the greater majority of us "increasingly tempted to see our problems not as invitations to mindful mastery but as bodily problems to be medicated away—as if we were less than human. Life's difficulties become not an occasion for development of character and virtue but 'medicalized' problems calling for a prescription,"⁵⁷ thus contributing to individuals and societies that are less merciful and empathetic, but more selfish and relationally shallow. Since mercy often springs up "at the point when humans recognize their limitations and weaknesses,"⁵⁸ MMTs might hinder people from recognizing their weaknesses and thus lack mercy for others.

This possibility for abuse becomes increasingly disturbing when considering the unborn. It seems likely that, should such MMTs become mainstream, pregnant women considering abortion would feel encouraged to abort their babies knowing that they could take a drug afterward and forget that they did so, or at least forget the emotional trauma. One Canadian patient who has participated in a trial of a memory-modifying drug disturbingly recounts, "Before, I couldn't keep this thing away [speaking of the traumatic memory]. Now, I can't find it.... It's like you put a bomb under that memory.... When I do think of it, it doesn't upset me. It's like a sad scene from a movie, not part of my life."⁵⁹ If such drugs are capable of essentially divorcing us from a part of our lives, one wonders how that could really be a mercy after all.

Another problem for mercy concerns possible military applications for memory-erasing drugs. Such drugs may be used to make soldiers forget the atrocities they commit or create the perfect spy who will not remember information he has passed on after taking the drug. If soldiers

⁵⁶ Phelps, et al., "Memory Editing," 49.

⁵⁷ Gilbert Meilaender, *Neither Beast nor God: The Dignity of the Human Person* (New York: Encounter Books, 2009), 5.

⁵⁸ Rogerson, *A Theology of the Old Testament*, 195.

⁵⁹ DePergola II, "The Neurostructure of Morality," 218.

knew they could kill and then forget that they did, would that not open the door to more gratuitous violence in war? Moreover, would informing soldiers about the use of MMTs before battle “make them less anxious to enter into it? Could this problem also put soldiers and rescue workers in even greater danger?”⁶⁰ In such troubling cases, MMTs would certainly not lead to persons or societies of greater mercy; instead the result may be “a debased humanity.”⁶¹

Justice

MMTs also pose unique problems for justice and the legal system.⁶² For instance, such technologies may jeopardize cases of sexual assault that would require the victim to retain the memory of their trauma for the sake of adequate legal testimony.⁶³ MMTs might one day be able specifically to erase episodic memory (memory of the experience) while leaving semantic memory (memory of the facts regarding the events) intact, which would presumably reduce the victim’s emotional distress while still enabling the victim to testify accurately.⁶⁴ However, if victims testify without emotional attachment to their story, juries may disbelieve victims’ claims or think that they do not care enough to bring their perpetrators to justice. MMTs may also hurt efforts at seeking forgiveness (or remove the possibility of forgiveness entirely) because the person wronged might no longer think that there is anything to forgive.⁶⁵ Furthermore, MMTs would raise the question, “Should a physician who effectively prescribes propranolol to a rape victim be prosecuted for tampering with evidence or obstructing justice?”⁶⁶ since “dampening memories of criminal acts could be considered tantamount to contaminating legal evidence, and legal scholars have debated whether people might therefore have a moral duty to remember traumatic events.”⁶⁷

Such implications could prove even more damaging on a global scale.

⁶⁰ Henry, et al., “Propranolol and the Prevention,” 16.

⁶¹ Brent Waters, *This Mortal Flesh: Incarnation and Bioethics* (Grand Rapids: Brazos, 2009), 165.

⁶² Volf lists four redemptive uses of memory associated with justice: Personal healing, acknowledgement of the truth, solidarity with victims, and protection from further violence. Cf. Volf, *The End of Memory*, 27–33.

⁶³ Cf. J. A. Chandler, et al. “Another Look at the Legal and Ethical Consequences of Pharmacological Memory Dampening: The Case of Sexual Assault,” *Journal of Law, Medicine, and Ethics* (2013): 859–71.

⁶⁴ This prospect has received the pet name “cosmetic neurology” (Nash, et al., “Public Attitudes”).

⁶⁵ Henry, et al., “Propranolol and the Prevention,” 16–17.

⁶⁶ Henry, et al., “Propranolol and the Prevention,” 15.

⁶⁷ Nash, et al., “Public Attitudes,” 886.

For instance, the President’s Council on Bioethics raises a hypothetical scenario in which Holocaust survivors take memory-erasing drugs to “delete” their memory of the Holocaust; the Council finds such a possibility “deeply troubling” since the entire human race would be demeaned by such a “mass numbing of this terrible but indispensable memory.”⁶⁸ This exercise illustrates “that people’s memories of terrible experiences can be instrumental in establishing safeguards that prevent other people from suffering similar experiences in the future.”⁶⁹ Thus MMTs must not tamper with our “responsibility to bear witness to horrific events and perhaps to advocate for change so similar events can be avoided, or their effects ameliorated.”⁷⁰

Another issue concerns availability of MMTs to underprivileged communities: “Will they be affordable to everyone? Will they be in such short supply and/or so expensive that only the very wealthy will have access to them?”⁷¹ Also, “[W]ho should be allowed to receive that treatment? Should it go only to those who can afford it? What about children?”⁷² Questions such as these make justice regarding MMTs a very complicated issue indeed.

Godliness

As God’s creatures, our lives are not our own but depend on God in fundamental ways in order to realize our true identity. We are thus called to be godly “stewards of life, ordering [our] lives in obedience to God’s will and commands.”⁷³ Would using memory-erasing technologies, then, help to shape our identity to fit such a God-centered vision of human life and destiny? Rather than rushing to answer no, consider several scenarios: What if a Christian struggling with gender dysphoria were to conclude that God does not approve of his desire to change his gender and thus seek to use MMTs to erase all the memories that may contribute to his ungodly desire? Or what if a Christian struggling with pornography addiction (or another addiction) wants to use MMTs to delete the earliest memories wherein the addiction began in order to make it easier to kick the habit? Moreover, what if MMTs become so advanced that people can remove episodic and emotional memories but keep semantic memories

⁶⁸ The President’s Council on Bioethics, “Beyond Therapy: Biotechnology and the Pursuit of Happiness”; cf. Henry, et al., “Propranolol and the Prevention,” 16–17; and Liao and Wasserman, “Neuroethical Concerns,” 39.

⁶⁹ Nash, et al., “Public Attitudes,” 886.

⁷⁰ Tenenbaum and Reese, “Memory-Altering Drugs,” 40.

⁷¹ Henry, et al., “Propranolol and the Prevention,” 15.

⁷² Gibbens, “Memories Can Be Altered in Mice.”

⁷³ Waters, *This Mortal Flesh*, 146.

to remember the horrible facts of the addiction and thus avoid it in the future? Or what if a Christian inclined toward pedophilia wants to delete his memory of being abused as a child in order to help remove his craving to commit the crime in the future? Do such cases merit the use of MMTs?

These are thorny situations indeed. Perhaps the best response is to withhold a generalized answer and say that each individual case must be judged on its own merits. The difference between using MMTs or not using MMTs may rest in what therapists already term “working things through.”⁷⁴ For example, “working things through” looks different for a person grieving versus a person trapped in pathological grief. This issue would require prayerful wisdom, assuming that the MMT could work with such specificity with no side effects (which is doubtful given memory’s complexity). Whatever the case, we should recognize that God “looks on the heart” (1 Sam 16:7 ESV), “is near to the brokenhearted and saves those who are crushed in spirit” (Ps 34:18 ESV). In other words, we should proceed with a humble trust in God, seeking to live obediently before Him and recognizing ourselves as sinners in desperate need of His grace.

Concerning godliness on the social and political levels, MMTs for memory erasure raise very troubling questions in terms of censorship and government control. For example, what if China were to force all Christians within its borders to take an MMT to forget their conversion experience? Or what if repressive governments were to use MMTs to force those working for justice to forget the memory of their ever joining their causes? Harkening back to George Orwell’s *1984*, Volf recalls that “The Party erased, the Party rewrote, the Party controlled—the present, the past, and the future . . . mask[ing] their misdeeds by denying that they took place.”⁷⁵ Christians should take this warning to heart, remembering that advances like MMTs might easily become oppressive sources “of economic power and . . . political power,”⁷⁶ sources that godly people must expose and resist by holding onto the memories of what really happened. In Volf’s words, “[R]emember the misdeeds and you erect a barrier against future misdeeds.”⁷⁷

Love

Our relationship with God entails relationships of loving fellowship

⁷⁴ Henry, et al., “Propranolol and the Prevention,” 16.

⁷⁵ Volf, *Exclusion and Embrace*, 233.

⁷⁶ Fabrice Jotterand, “The Politicization of Science and Technology: Implications for Nanotechnology,” *Journal of Law, Medicine, and Ethics* 34.4 (2006): 658.

⁷⁷ Volf, *Exclusion and Embrace*, 234.

with others as a divine calling given to each of us. The truth, as Volf reminds us through his exploration of the Exodus and the Passion, is that we actually do have such ground for love since God has acted so sacrificially to rescue us from our sinfulness and reconcile us with Himself and with others, even with our enemies. These memories shape Christians’ “lives communally and individually”⁷⁸ into an eternal fellowship of redeemed sinners knit together by God’s love through Christ and His Spirit. “For Christians,” says Volf, “this is what reconciliation is all about. Reconciliation with the wrongdoer completes the healing of the person who suffered the wrong.”⁷⁹

All these truths serve to remind us that MMTs should be used, if at all, to bolster and not to break communities, which grow through shared memories. Modifying those memories would “affect what we believe to be true about the world and about ourselves . . . [since] memories serve as some sort of epistemic evidence for events that have transpired and for one’s roles in those events.”⁸⁰ Given the extremely dangerous potential of MMTs to rupture both the internal web of one’s memory and the external web of collective memory, I would not recommend using MMTs except for the most extreme impediments, such as debilitating PTSD, constant suicidal ideation, inexorable pedophilia, or severe narcissism.

Conclusion

Given the complex nature of memory and the Christian virtues of mercy, justice, godliness, and love, the Christian perspective would urge people not to seek to delete their memories of trauma, nor to hide from them, but to bring them to God to have him redeem and employ those memories as identity-forming monuments to the astonishing power of his restoring grace.

⁷⁸ Anderson, “An Ethics of Memory,” 233.

⁷⁹ Volf, *The End of Memory*, 84.

⁸⁰ Liao and Wasserman, “Neuroethical Concerns,” 38.