

Special Section: The Value of Personal Memories

Technologies to Remember or Forget? A Perspective from Reminiscence and Life Review

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This paper addresses recent technological developments in altering or even erasing memories. From a critical perspective these technologies are seen as artificial as they disrupt identities and true happiness. This basically resonates with the value attributed to remembering in the field of reminiscence and life review. From a proponent perspective it is argued that technologies have always been used to filter our memories and thereby support the dynamics of identity development. This position is consistent with a more dynamic view of reminiscence and life review that also takes different attitudes towards remembering and forgetting into account. The last part of the paper combines both perspectives in an evaluation of the use of propranolol, a drug that might contribute to willful forgetting under specific conditions. This evaluation also raises new questions for the field of reminiscence and life review.

Macbeth:

*Canst thou not minister to a mind diseas'd,
pluck from the memory a rooted sorrow,
raze out the written troubles of the brain,
and with some sweet oblivious antidote
cleanse the stuff'd bosom of that perilous stuff
which weighs upon the heart?*

—Macbeth, Act 5, Scene 3

Some 400 years ago, Macbeth raised a question that still sounds like science fiction. Nevertheless, technologies to enhance our psychological functioning blossom as never before, mainly due to the growth of the neurosciences. Several recent studies suggest that it is possible to alter or even erase memories by the use of pharmacological and technological interventions (Cappeliez, this issue). Such new technologies often receive *either* skepticism *or* praise. In an ethical reflection on technologies that shape who we are, Erik Parens (2015) makes a plea for binocularity. Binocularity refers to the phenomenon that our two eyes make us see two somewhat different realities that we blend together so that we can see depth. In a similar way, the pros and cons of new technologies need to be carefully weighed in order to provide depth to considerations about their value. In this paper, I intend to apply this binocular view to memory technologies. I will first describe the two main

positions. For each position, I will give a short description of the perspective on technology in general and on memory technologies more specifically. Furthermore, I will add reflections and evidence from the field of reminiscence and life review. After exploring each stance, I will try to take a binocular view, focusing on one specific technology: the use of a drug like propranolol to alter traumatic memories. This reflection on the use of memory technologies poses interesting new questions for the field of reminiscence and life review.

A Critical Perspective

A key position of critics of technology in general is that it may threaten our authenticity (Parens, 2015). Technologies may separate us from who we are and from the world as it really is. Critics therefore see technologies not as neutral means to a desired end, but rather as value-laden in itself. As technology might distort our human nature, it is negatively valued as 'unnatural' or 'artificial.' The basic life view corresponding to this position is that of tragedy: suffering is an essential part of the human condition. Technology critics therefore often make a plea for acceptance and gratitude, rather than attempting to change or eradicate all suffering. Some might argue that suffering contributes to meaning in life and even to personal growth.

In a report from the United States named "Beyond Therapy: Biotechnology and the Pursuit of Happiness", the President's Council on Bioethics (PCB, 2003) takes this critical position on memory technologies. The Council raises questions like: If we do forget an event in our lives, can we still be true to the world, others, and to ourselves? If we do not remember truthfully, can we still maintain

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justice and hold each other accountable for what we do? If we ease the pain, do we not foreclose the possibility of witnessing what true happiness could be, also finding meaning in adverse events?

A central point in the ethical analysis of the Council is that memories are an essential part of our personal identities (PCB, 2003). Memories are important as they allow and enable us to know who we are. Erasing and altering memories could thus alienate us from ourselves. By “rewriting” memories pharmacologically we might succeed in easing suffering, but this comes with the risk of falsifying our perception of the world, putting our relations at risk, and undermining our true identity. Furthermore, a stable identity is a prerequisite for the experience of true happiness. True happiness goes beyond feeling well but also consists of developing character qualities that may help to accept, deal with, and attribute meaning to our suffering. With erased or altered memories, we might feel better about ourselves, but we would no longer discipline our passions, refine our sentiments, or cultivate our virtues.

The Council acknowledges that memories are dynamic (PCB, 2003). The meaning that is attributed to a memory may change over time and this may also change the role of a particular memory to our personal identity. However, seeking cure for a particular negative memory will distort how memory works as a whole. It distorts how we weave past, present, and future together in a meaningful way. Hence, technologies to erase or alter memories are in the end not neutral but artificial and serve to distort our authentic memory functioning, our stable identities, and our true happiness.

Many researchers and practitioners in the field of reminiscence and life review might agree with this line of reasoning. Reminiscence and life review are generally seen as naturally occurring processes that involve the recollection and evaluation of both positive and negative memories (Webster & Haight, 2002). Both Butler (1963) and Erikson (1950) would acknowledge suffering as an essential part of every person’s life. They would agree that more than the memories, per se, it is the way that we remember them that makes reminiscence and life review successful. The evaluation, acceptance, reconciliation, and integration of memories in a broader picture of one’s life story is necessary to achieve ego-integrity as the acceptance of one’s one and only life cycle. Starting from its psychoanalytical roots, the field has focused mostly on the value of memory retrieval, even those that appeared to be repressed or forgotten.

There is extensive research that indeed shows how important memories are for our identities and well-being. Nowadays, it is acknowledged that reminiscence and life review are important for identity development across the lifespan, and not only in later life (Fivush, Habermas, Waters, & Zaman, 2011; Pasupathi, Weeks, & Rice, 2006; Westerhof & Bohlmeijer, 2012). In line with this broadened vision, researchers have distinguished several social, instrumental, and integrative functions of life review (Webster, 1993; Robitaille, Cappeliez, Coulombe, & Webster, 2010; Westerhof & Bohlmeijer, 2014; Wong &

Watt, 1991). Social functions are especially important in establishing and maintaining social relations as well as in transmitting valuable memories to other generations. Instrumental functions are important to come to terms with losses; for example, by remembering earlier coping strategies or in regulating emotions. Integrative functions help to continue or flexibly adjust one’s identity, to integrate positive and negative memories, and to find meaning in adversity.

Research has shown that the way people reminisce about their past is related to their mental health and well-being (Westerhof, Bohlmeijer, & Webster, 2010). Positive reminiscence functions like identity construction, problem solving, and death preparation are related to mental health and well-being (Cappeliez, Rivard, & Guindon, 2007). These functions also contribute longitudinally to mental health and well-being over time (Cappeliez & Robitaille, 2010; O’Rourke, Cappeliez, & Claxton, 2011). When the natural process of reminiscence and life review is hampered, several interventions exist, ranging from reminiscence interventions to life review therapy (Webster, Bohlmeijer, & Westerhof, 2010). These interventions are able to enhance psychological resources like meaning in life, mastery, and ego-integrity and thereby contribute to mental health and well-being (Pinquart & Forstmeier, 2012).

We may conclude that in general, remembering is valued in the field of reminiscence and life review, rather than altering or erasing memories. From this perspective technologies might indeed be different from everyday remembering as they can contribute to willful forgetting. Even though people often say ‘forget it’ in everyday life, inducing forgetting seems almost impossible to do. In acceptance and commitment therapy, the pink elephant exercise is used to demonstrate that avoidance of suffering won’t work (Kanter, Baruch, & Gaynor, 2006). People are asked *not* to think of a pink elephant. Rather than avoiding the mental image, it is intrusively there. In a similar way, trying to consciously repress a negative memory only helps to have it enter awareness. Hence, a technology might be able to artificially induce altering or erasing a memory in a way that is not possible in everyday life.

To conclude, the basic view of life and suffering, the empirical findings, and the interventions of the field of reminiscence and life review seem to support the reasoning of the Council that memories are important for our social relations, dealing with the world, and construing our identity as well as for our true happiness. Erasing or altering memories by technology appears as artificial and unnatural.

A Proponent Perspective

People who favor technological advancement often hope that it will help to promote authenticity (Parens, 2015). They argue that we have always used technologies to shape who we are as human beings. It is thus natural to use technologies, and these may help us to create the kind

of persons who we are. Technology is in itself not value-laden, but it may be used for good or bad purposes. The basic view is of life as a comedy: people don't have to accept suffering, but problems can be overcome, also by a fair use of technological possibilities.

The Presidential Council has been criticized for drawing an overly negative picture of the dangers of memory technologies (Henry, Fishman, & Younger, 2007). Although it acknowledges that our memories and identities are dynamic, it has also been criticized for adhering to outdated concepts of truth and stability as standards to judge the value of memory technologies (Bell, 2008). In everyday life, memories are always changing as people weave them in more encompassing life stories that express their narrative identities. There is no 'true' memory or 'true' identity that we can refer to. Hence, altering and forgetting memories is just as natural as retrieving them. Furthermore, technologies that alter or eradicate memories may also contribute to personal identity and happiness. Some memories might be so devastating to our life and functioning that they thwart the possibility of achieving an authentic sense of self. Indeed, Louise O'Donnell-Jasmin, who was raped at the age of 12, reported after medication: "I have regained my identity. What was broken when I was 12 was fixed. They have given back myself" (quoted in Bell, 2008). Hence, the drug does not remove authenticity, but rather restores it.

Proponents might argue that we already use many technologies to create who we are (Parens, 2015). One only needs to think of the millions of people in the United States who take drugs for depression, anxiety, or ADHD. New invasive brain technologies are emerging to treat mental disorders, like electroconvulsive therapy, vagal nerve stimulation, deep-brain stimulation, or repetitive transcranial magnetic stimulation. So, is it really something different to use drugs and technologies to help us remember and forget?

Indeed, people have also used technologies to help them remember their lives: from the first person who made a print of his hand in a cave to the writing of an autobiography or the most intricate software to create a multimedia life story book. Hence, autobiographical memories are more than internal representations of an outside world (Sutton, 2016). Technologies support us to maintain an external autobiographical memory. Just as we write a shopping list as an external memory aid, we make photographs, write diaries, or use social media to help us remember our personal lives. Technologies can thus support us in remembering and in maintaining our identity and happiness.

Proponents would consequently argue that technology is not intrinsically good or bad, but it depends on how it is being used. When we use technologies to explore who we are, the world will be filtered in many ways (Walker Rettberg, 2014). Different technologies filter our experiences and memories in different ways. Text-based technologies, like writing, filter memories in a different way than do image-based technologies, like photographs. As we know, a picture can tell more than a thousand words.

Besides technological filters, cultural filters support and validate certain experiences and memories at the expense of others. For example, people may create glorious statues, movies, books, and ego documents of a war and thereby deny or forget the sufferings it brought in everyday life. Technological and cultural filters thus result in different versions of memories and identities: they do not only help in remembering certain memories, but also, perhaps more implicitly, in forgetting others.

Although we have seen that the field of reminiscence and life review generally aligns with a critical stance towards memory technologies, there are also some thoughts and findings that might support this more enthusiastic stance. People tend to vary widely in their attitudes towards reminiscence and life review. Coleman (1986) already distinguished between reminiscers and non-reminiscers. Some reminiscers valued their memories of the past, others were troubled by their memories. Some non-reminiscers saw no point in looking back, and some were more or less actively avoiding this. Hence, it is not necessarily either remembering or forgetting that contributes to our identity. Furthermore, studies generally show relations of reminiscence functions to psychological resources, mental health, and well-being, but these relations are weak or moderate. Again, it is not either remembering or forgetting that contributes to our happiness.

Furthermore, the integration of the field of reminiscence and life review with work on autobiographical memory and narrative psychology has contributed to a dynamic perspective on personal memories (Westerhof & Bohlmeijer, 2014). Bluck and Levine (1998) argued that memories are dynamically reconstructed every time they are recollected, also in function of one's identity. Hence, they are not like postcards or photos in an album. Reviewing personal memories in the sense of attributing meaning to them in a narrative about one's own person and life may also change the memories (Bell, 2008). This process even continues when we reread our life narratives later in time (Randall & McKim, 2008).

Last, reminiscence and life review interventions have made use of technologies as external autobiographical memory aids. Cultural artifacts, like photographs, movies, or music are often used to support reminiscence in interventions. Life story books and written autobiographies have similarly been used to support people in sharing and evaluating their memories. New information and communication technologies are increasingly applied to support reminiscence and life review interventions (Lazar, Thompson, & Demiris, 2014). It is an interesting question how interventions might contribute to filtering some memories at the expense of others. At first sight, filtering might be minimal. Reminiscence and life review interventions generally include memories across the life cycle, the counselor organizes an appreciative climate, and the purpose is often to contribute to mental health and well-being through the accumulation of psychological resources. Yet, even under these conditions some filtering

might be going on. This becomes clear in the ethical dilemmas that the confession of long-held secrets or even moral transgressions poses for participants and practitioners in interventions. Although reminiscence and life review have a strong focus on remembering, from the perspective of filtering, interventions also contribute to particular versions of life stories.

To conclude, several individual preferences and social and technological filters support the dynamic processes of remembering and forgetting. Some assumptions and findings in the field of reminiscence and life review therefore support a more enthusiastic view on the use of memory technologies.

Towards a Binocular View: The Case of Propranolol

The two positions on technology differ profoundly in how they view the meaning of being human, living and suffering. As is often the case, these positions are augmented when placed against each other. As we have seen, things are not just black-and-white when we apply the perspective of reminiscence and life review. Parens (2015) also argues that there is more common ground than one might expect at first sight. First, no one would argue that forgetting the past is a general aim. Proponents of both the critical and the enthusiastic position would agree that we do not want to lose our past, as we would consequently lose our identities. Second, no one would argue that a memory-altering drug should be taken in the normal course of everyday life. For example, when people embarrass themselves, they might want to forget what happened. But no one would advise to take a pill to achieve this. In fact, this would be of little use, as others will remind us of what happened! Third, both positions would agree that an offender like Lady Macbeth should not take a pill to wash away her guilt or that an offender should give a pill so that a victim wouldn't remember the assault. Last, no one would argue that a memory-altering drug should really make us forget an event. A soldier who saw his comrades die through a roadside bomb should remember the incident in order to witness the atrocities of war. So, there is no easy answer in the sense that technologies to alter or eradicate memories are always good or bad. It is therefore important to look at a more specific case.

I will focus on the possible use of propranolol in altering traumatic memories in post-traumatic stress disorder (PTSD). Propranolol has mainly been proposed as a drug to prevent PTSD by altering the traumatic memory before the disorder develops. However, it has also been argued that propranolol might change existing memories (Nader, Hardt, & Lanius, 2013). This is actually the treatment of Louise O'Donnell-Jasmin, mentioned earlier in this paper. Although this treatment is even more speculative than the prevention of PTSD, it comes closer to the field of reminiscence and life review as this field has mainly focused on the retrieval and evaluation of consolidated memories that often happened long ago.

Propranolol is a drug that might support altering memories (Giustino, Fitzgerald, & Maren, 2016). Propranolol is a beta-adrenergic antagonist (a beta-blocker) that hampers the effect of norepinephrine. Norepinephrine is a neurotransmitter that mobilizes the brain and body for action, in particular in situations of extreme stress or danger. It also enhances the consolidation of memories, in particular through the activation of the amygdala, an almond-shaped part of our brain that also plays an important role in emotion regulation. When recollected, these memories are not only very vivid, but also accompanied by the strong negative feelings that occurred at the time of the original event. Due to this consolidating effect, norepinephrine is assumed to play an important role in PTSD (Giustino et al., 2016).

Propranolol works against the effects of norepinephrine in the consolidation of memories. It especially helps to numb the emotional reactions that are associated with traumatic memories. The drug is already regularly used to treat hypertension, arrhythmia, migraines, and angina pectoris. It is therefore considered safe with relatively few side effects as well as being cheap and affordable (Henry et al., 2007). Propranolol is acclaimed for its potential to prevent the development of PTSD after a traumatic experience. In this case, the treatment has to start within about 6 hours after the event and continue for about two weeks with doses up to 240 mg/day (Hoge et al., 2012).

Early experiments showed that propranolol might help to relieve the emotional impact of memories of negative events (Nader et al., 2013). However, a recent meta-analysis of five studies showed that there is no effect on the development of PTSD in comparison to a placebo (Argolo et al., 2015). These findings are not definitive as sample sizes were small, confounders could not be analyzed, the time between trauma and intervention was not always optimal and longer follow-up periods were missing. Similarly, a Cochrane review concludes that there is not sufficient evidence for any medication as a preventative treatment of PTSD at present and that more high quality research is needed to provide stronger evidence (Amos et al., 2014). This situation is not untypical for an application that is still in the phase of 'proof of concept' (Qi, Gevonden, & Shalev, 2016).

How may we judge the possible use of propranolol for altering traumatic memories? Would it offer acceptable new possibilities for the field of reminiscence and life review? There may be specific conditions that would allow the use of memory technologies like propranolol for this purpose. Still, there remain a number of empirical questions to be answered before a definitive judgment can be made. Interestingly, these questions can also move the field of reminiscence and life review forward.

A first important question is what exactly we change when we say a memory is altered? Memories have a lot of qualities, like their episodic quality (i.e. the memory for the actual events), their vividness, their function for identity, their emotionality, and their specificity (Singer et al., 2014). Propranolol appears to be especially effective in

dampening the emotional reactions that accompany the memory, but it is not clear whether or not it also affects other qualities (Henry et al., 2006). Furthermore, Nader et al. (2013) argue that the drug might exert an effect on just one specific memory. When only one memory is recollected after the use of propranolol, this specific memory might be targeted, but it is not known whether this is true or not. So, it remains unclear how the drug interacts with several memory characteristics. More research is needed to assess whether this drug or a better one can indeed induce specific effects. For the field of reminiscence and life review this also poses the question what exactly happens to the qualities of memories when we retrieve, evaluate, accept, and integrate memories.

A second question is whether we can accept, integrate, and attribute meaning to all that has happened to us? In the field of autobiographical memories there is now some debate on the limits of attributing meaning to memories. The benefits of meaning making may depend on the type of events, time, personal characteristics and the sociocultural context (Greenhoot & McLean, 2013). Some memories could be so traumatic and detrimental to one's functioning that they foreclose the possibility to find meaning. Time is another issue here: what is a good time to start meaning making? Whereas not so long ago, it was recommended that persons experiencing trauma start disclosing traumatic events early after they happened, the current advice is to take an attitude of watchful waiting (Qi et al., 2016). Furthermore, personal histories might be so full of suffering that it will be difficult to find the resilience to also find positive meanings in what has happened (Sales, Merrill, & Fivush, 2013). Social relations are also important: parents may provide scaffolds to learn meaning making (Fivush, 2008), and other persons may constitute a wisdom environment (Kenyon, 2003). Our personal memories and our attempts to make meaning might also be more or less valued in the culture and society we live in. For example, the time of reconstruction after the Second World War was a period in the Netherlands where the then recent past was hardly discussed and eyes should be focused on the future. More insight is needed in the conditions for the intricate processes of meaning making. Hence, it would be good to develop better theories and assessments about the limits of the meaning making approach. When these limits are reached indeed, it would be good to seek alternatives.

A last question is whether such an alternative could and should be supported by technological or pharmacological means? Existing therapies, like cognitive behavioral therapy, eye movement desensitization and reprocessing (EMDR) or narrative exposure therapy (NET) all focus strongly on the confrontation and processing of traumatic memories (Qi et al., 2016). Similarly, life review therapy has been put forward as a way to treat PTSD by attributing meaning to traumatic memories (Daniels et al., 2015; Maercker, 2002). Just as there are limits to the meaning making approach, there are also limits to evidence-based treatments of PTSD. Some traumatic memories might be resistant to current

treatments. In such cases, technologies might enable altering and forgetting memories in a way that is difficult to achieve in more 'natural' ways, as we have seen above. Propranolol or a better drug might prove effective in altering such memories. However, treatment should consist of more than a drug. When propranolol is used to treat earlier traumatic memories, people have to retrieve the traumatic memory in order to intervene in the reconsolidation process. Hence, memories still need to be acknowledged and a respectful and safe environment is needed for this. Furthermore, people will need to be supported in finding closure and reclaiming other past or future identities in order not to risk the trap of complete resignation and foreclosure. Interventions that focus on a present orientation, like mindfulness or acceptance and commitment therapy or interventions that focus on the future, like goal setting or possible selves interventions, could be applied here.

To conclude, when we know which aspects of specific memories we target, when we are confronted with traumatic memories that preclude possibilities to find meaning, and when other interventions don't work, technologies like propranolol could be used in a stepwise program, but only when combined with interventions that empower people to reclaim other identities. In this way, we can find a balance between accepting suffering and attributing meaning to it on the one hand and easing unbearable aspects of suffering on the other hand.

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