



**Sylvia R. Karasu M.D.**  
[The Gravity of Weight](#)

# Counterfactual Thinking: Imagining What Might Have Been

Those "metaphoric forks" of alternate possibilities along the path of life

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Watercolor of the sinking of the Lusitania by the Germans in 1915. In a 1963 episode of "The Twilight Zone," a theoretical physicist travels back in time and attempts unsuccessfully to change the past by warning the ship's captain of the U-boats in the area and avoid the boat's sinking. Source: Alamy stock images, used with permission. Contributor: akg-images.

Disheartened by two world wars and the threat of nuclear annihilation, theoretical physicist Paul Driscoll enlists the assistance of his colleague to send him, by time machine, back in time in the hope of altering the course of history. He makes three attempts--to warn the Japanese about the devastating effects of the bomb about to be dropped on Hiroshima in August 1945; to assassinate Hitler in August 1939; and to prevent the sinking of the Lusitania in May 1915—and three times he fails. He is determined, though, to settle for a simpler life than the 20th century affords and once again travels back, this time to a Midwest American summer in Homeville, Indiana, 1881. He knows President Garfield will initially survive an assassination attempt that July, only to die months later. Paul, though, does attempt to prevent an accidental fire he has read about that will damage a schoolhouse and injure 12 of its children, but in doing so, he becomes the one responsible for causing the fire. Paul's conclusion, "The past is

inviolable, sacred, and not for interlopers; leave yesterdays alone, and let there be tomorrows." Those 1960s television fans will remember this episode, *No Time Like the Past*, in Rod Serling's *The Twilight Zone* (March 7, 1963, 4th season, Original Series)



Portrait of Maud Muller by John Gast, after J.G. Brown. Maud Muller is the subject of a poem of the same name by the 19th century American poet John Greenleaf Whittier. The poem contains the line "It might have been." Source: Wikimedia Commons/ Public Domain, from Library of Congress Collection

Many novelists, including Sinclair Lewis, in *It Can't Happen Here* (1935) and Philip Roth, in *The Plot Against America* (2004) have given us their versions of alternate history. Film buffs will remember *Sliding Doors* (1998) in which the movie depicts two very different scenarios depending on whether Helen catches or misses her train. American poet Robert Frost explores this sentiment in his 1916 iconic poem, *The Road Not Taken*.

Perhaps the most bittersweet rendition is found in the poem by 19th century American Quaker poet John Greenleaf Whittier. The poem *Maud Müller* tells the saga of a poor young maiden who imagines marrying a judge whom she meets as he travels through the field on which she is harvesting hay and to whom she has given water. This man is taken with her as well, but "...closing his heart, the Judge moves on," and both she and the judge ultimately marry other people. Wistfully, they long for each other throughout their lives. Writes Whittier, "For of all sad words of tongue or pen, the saddest are these: 'It might have been.'"

Thinking about "what if?" or "if only" or "what might have been" is inevitably very much part of the human experience. Most have had

these automatic and even pervasive *counterfactual* thoughts--"literally contrary to the facts," i.e., "alternative



Walter Langley, "Tender Grace of a Day," circa 1930. This woman looks wistfully out the window as she perhaps thinks of what might have been. Gallery Oldham, Greater Manchester, England. Source: Historic Collection/Alamy Stock Photo, used with permission.

versions of the past," (Roese, *Psychological Bulletin*, 1997) or a "mental simulation of alternatives to reality." (Blix et al, *Frontiers in Psychology*, 2018) They are a "common feature of our conscious mental landscape." (Epstude and Roese, *Personality and Social Psychology Review*, 2008.) The concept of counterfactual thinking originated in the ancient Greek writings of Plato and Aristotle and their discussion of the subjunctive tense but was developed more fully by 17th century German philosopher Leibniz, who wrote of alternative worlds. (Roese and Olson, in *What Might Have Been: The Social Psychology of Counterfactual Thinking*, 1995, pp. 2-6) The term itself was first used in a journal article in the mid-1940s. (*Oxford English Dictionary*) Daniel Kahneman and Amos Tversky, in the early 1980s, researched it more systematically from a social-cognitive perspective, (Roese and Olson, p. viii) and Kahneman and Miller were the ones to note that certain emotions such as regret or disappointment could not occur unless there had been prior counterfactual thinking. (Roese, 1997 )

Counterfactual thinking is described as either *upward* ("Things could have been better") i.e., improve on reality, or *downward* ("Things could have been worse") i.e., worsen reality, and "count your blessings." (McMullen et al, in Roese and Olsen, 1995, p. 134; Kray et al, *Journal of Personality and Social Psychology*, 2010) Comparing reality to an imagined alternative can lead to negative emotions such as regret, shame, guilt or even a moral judgment of blame but also positive emotions such as relief and satisfaction (Byrne, *Annual Review of Psychology*, 2016), as well as appreciation and gratitude when fortuitous events occur that might not have. Attributing blame often depends on assessing whether someone could or should have done something differently. (Byrne, 2016)



"Orpheus Mourning the Death of Eurydice," by Dutch-French Romantic painter Ary Scheffer, circa 1814. Imagine how poor Orpheus must have ruminated over his lost opportunity to be with his beloved Eurydice because he disobeyed the gods and looked back at her as he was leaving the Underworld. Source: Wikimedia Commons/Public Domain

Research initially emphasized the dysfunctional aspect of counterfactual thinking. Potential negative consequences include increased anxiety, depression (Howlett and Paulus, *Frontiers in Psychiatry*, 2013; Broomhall et al, *Clinical Psychology Review*, 2017), and even rumination. (Roese, 1997) Quite specifically, vivid and frequent counterfactual rumination after a trauma is associated with post-traumatic stress disorder (PTSD) (Blix et al, 2018) "Mentally undoing" traumatic events, longing for an idealized past, and indulging in lost opportunities of "what might have been" generate increased distress (Krott and Oettingen, *Motivation and Emotion*, 2018), poignantly described in George Eliot's conclusion to *The Mill on the Floss*. (1860) After a devastating flood results in the drowning of Maggie and her beloved brother Tom, Eliot writes, "Nature repairs her ravages--but not all. The uptorn trees are not rooted again--the parted hills are left scarred...To the eyes that have dwelt on the past, there is no thorough repair." (p. 543, reprinted Penguin Classics edition, 1985)

Researchers, though, now are more apt to focus on the beneficial effects of counterfactual thinking, particularly in changing behavior (Epstude and Roese, 2008) and even "weaving a tapestry of meaning" in a person's life." (Kray et al, 2010) For example, they attribute three major functions to counterfactual thinking: regulating affect whereby imagining other scenarios can make people feel better about their current circumstances; preparing for the future by focusing on avoiding any previous failures or mistakes; and enabling a "perception of predictability," i.e., feeling more in control of a situation. (Sherman and McConnell, in Roese and Olsen, 1995, pp. 200-201; 226.) Along those lines, Tykocinski (*Personality and Social Psychology Bulletin*, 2001) writes of "retroactive pessimism" whereby counterfactual thinking allows people to accept some disappointment or trauma by believing the outcome was



"Disappointment," by American artist Julius LeBlanc Stewart, 1882. The emotion of disappointment can occur only when someone is able to contemplate alternatives to the current reality, i.e., engage in counterfactual thinking. Source: Wikimedia Commons/Public Domain. Photographer: Bluehowz.



"Late Regret," copper engraving by Halbou, 1710. Those who have an impaired ability to engage in counterfactual thinking are not able to experience regret and may fail to learn from their mistakes. Source: Alamy stock photo, used with permission. Contributor: imageBROKER; Photographer: BAO

in fact inescapable--a kind of adaptive coming to terms with reality. For example, people sometimes offer consolation after a tragedy by emphasizing the inevitability of the event. In other words, counterfactual thinking can undo "metaphoric forks on the path of life" and "ironically" foster a sense that the actual path chosen was destined. (Kray et al, 2010)

Counterfactual thinking can provide "a roadmap to transition" to a different and more successful future situation. (Byrne, 2016) Dieters, for example, after a failure to lose weight or after regaining weight they have lost, can learn from their mistakes and imagine a different strategy to achieve their goals. It can also *imply* a sense of causality: "If only she had followed her diet, she would have lost more weight."

Judea Pearl (*The Book of Why: The New Science of Cause and Effect*, Pearl and Mackenzie, 2018) and his co-author write extensively about causality and what they call the three rungs of the "Ladder of Causation:" observation, intervention, and imagining (i.e., counterfactual thinking.) (pp. 27-36) Imagining what might have been is both a "gift" and a "curse" and distinguishes humans from all other creatures, says Pearl. (p. 260) Pearl's particular interest is artificial intelligence: without the ability to envision alternate realities, a machine cannot answer the most basic question, "Why?" (p. 349) Researchers in artificial intelligence have yet to make a "moral machine," i.e., one capable of distinguishing good from evil and reflect on its own mistakes. (p. 368-9)

Although some researchers believe that counterfactual thinking begins in toddlers as they engage in pretend play (Byrne, 2016), others emphasize that it reflects a "highly complex cognitive capability" that does not develop until late in childhood. (Kulakova and Nieuwland, *Language and Linguistics Compass*, 2016) Significantly, those with schizophrenia or those who have damage to the prefrontal cortex and more specifically, the orbital-frontal cortex, have an impaired or diminished capacity for it and cannot learn from their mistakes. (Epstude and Roese, 2008; Kray et al, 2010) Those afflicted demonstrate an "insensitivity" to consequences resulting from their decisions (Byrne, 2016) and hence have a limited capacity to experience regret. (Kray et al, 2010)

*Bottom line:* Counterfactual thinking, as reflected in "what if," "if only," or "what might have been," is pervasive and automatic for most people. Initially considered dysfunctional, it can lead to increased anxiety and depression and even post-traumatic stress disorder when ruminating over lost opportunities or traumatic events continues, but it also has adaptive functions, such as regulating affect, preparing for the future, changing behavior, implementing goals, and even feeling appreciation. Counterfactual thinking is highly complex cognitively. To date, researchers in artificial intelligence have not been able to create a machine that can engage in counterfactual scenarios.

When counterfactual thinking is *upward*, people imagine things could have been better, and when *downward*, they imagine things could have been worse. Without it, people cannot experience disappointment or regret or even attribute blame. Just as the theoretical physicist in Rod Serling's *The Twilight Zone*, people cannot change the past. The ability to imagine other scenarios, though, can enable learning from these alternate realities and potentially create a better future.

## About the Author

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**[Sylvia R. Karasu, M.D.](#)**, is a clinical professor of psychiatry at Weill Cornell Medical College and the senior author of *The Gravity of Weight*.

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