



**Sylvia R. Karasu M.D.**  
The Gravity of Weight

LONELINESS

# The Biology of Loneliness

Part 2: The physical and psychological consequences of loneliness and isolation.

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Edward Killingworth Johnson's "The Young Widow," 1877. For many people, marriage provides protection from loneliness. When a spouse dies, as happened with Joan Didion, the surviving spouse experiences a silence and unending absence.  
Source: Victoria and Albert Museum, London, used with permission.

This is part 2 of a series. Please see [post 1 here](#).

“What I remember about the apartment the night I came home alone was its silence,” writes Joan Didion, in *The Year of Magical Thinking*, her book about the sudden death from a myocardial infarction, of John Gregory Dunne, her husband of 40 years. Didion described the “unending absence” that followed her husband’s death: “I could not count the times during the average day when something would come up that I needed to tell him. This impulse did not end with his death. What ended was the possibility of response.”

Loneliness is a “sorrowing over aloneness.” (Mendelson, *Contemporary Psychoanalysis*, 1990) Weisel-Barth, who writes of the “geography of deep protracted loneliness,” (*International Journal of Psychoanalytic Self Psychology*, 2009) called attention to *Genesis 2:18* in which God says, “It is not good for the man to be alone; I will make a helper who is right for him.”

Grief from the loss of a loved one, i.e., being lonely for one person (Alberti, *The*

*Biography of Loneliness*, 2019, p. 110)--emotional loneliness--(Fakoya et al, *BMC Public Health*, 2020) is a major cause of these unbearable feelings, as Joan Didion poignantly writes, but someone can be generally lonely, i.e., have *social loneliness*, and experience that subjective sense of pain, distress, and disconnection from a lack of a wider social network, as discussed in Part 1. (Fakoya et al, 2020) These are people who feel "on the social perimeter." (Cacioppo et al, *Psychological Bulletin*, 2014)

Significantly, we humans are “meaning-making creatures” in that we perceive social relationships “even where no objective relationship exists,” such as between a reader and author or even with characters we see on television. (Hawkley and Cacioppo, *Annals of Behavioral Medicine*, 2010.) Our need for social relationships is so strong--some would call it a "biological need" (Holt-Lunstad, *Public Policy & Aging*, 2017)--that solitary confinement is the "penalty of last resort" (Cacioppo and Patrick, *Loneliness: Human Nature and the Need for Social Connection*, 2008, p. 11) and considered torture when it lasts longer than 15 days. (Ahalt et al, *The BMJ*, 2017)

Loneliness is more often related to relationship *quality* rather than *quantity* such that people not only need the physical presence of another but also “mutual value, trust, communication, and collaboration toward common goals.” (Xia and Li, *Antioxidants & Redox Signaling*, 2018) Loneliness, then, can occur within a crowd, a marriage, a family, or even a larger social group. (Xia and Li, 2018)



Austrian artist Egon Schiele's watercolor of his prison cell, "One Orange was the Only Light," 1912, Albertina Collection, Vienna. Schiele had been imprisoned for seducing an adolescent, though the charges were later dropped. His image does seem to depict solitary confinement, which is considered torture for people if it continues for more than 15 days. Significantly, Schiele died of the Spanish Flu in 1918. He was only 28 years old.  
Source: Wikimedia Commons/Public Domain



Briton Riviere's "His Only Friend," 1871. Sometimes animals can provide protection from loneliness but humans often need more than just a physical presence.  
Source: Wikiart/Public Domain

Social isolation and subjective feelings of loneliness can also occur at any age. When seen in younger adults, studies have found those lonely, relative to those not lonely, are higher in anxiety, anger, and negative mood, and lower in optimism, social skills, and even emotional stability. (Cacioppo et al, *Journal of Research in Personality*, 2006)

More commonly, though, social isolation and loneliness are found among the elderly. In a review of 33 reviews, researchers found 50 percent of those over 60 are at risk for social isolation and 1/3 will experience some degree of loneliness later in life, (Fakoya et al, 2019) often due to changes in society, such as less cohesiveness among communities, greater geographical mobility, and households that are less likely to be intergenerational. (Fakoya et al, 2020) Further, retirement and decreased income, losses of significant loved ones over time, and declining health are also risk factors. (Kemperman et al, *International Journal of Environmental Research and Public Health*, 2019) One study presented to the U.S. Senate Aging Committee reported over 42 million older adults experience chronic loneliness. (Holt-Lunstad, 2017)

As many people prefer to remain in their own homes as they age and live independently whenever possible, people are “aging in place.” Social media, then, can become more important in reducing social isolation and a subjective sense of loneliness. (Kemperman et al, 2019) Social media can create “intimacy at a distance,” for those who live remotely from their families. (Alberti, 2019, p. 160)

Social media, including the use of the internet, though, can “undermine” a person’s wellbeing. (Xia and Li, 2018) For example, it is not “how often social media is used but whether it replaces or supplements offline relationships.” (Alberti, pp. 128-29) Personal demographics, individual mobility (e.g. ability to walk, bike, drive a car, or make use of public transportation), and participation in social networks all contribute to mitigating feelings of loneliness. Even a person's attachment to a neighborhood and the physical characteristics of the environment (e.g. attractiveness of the building, quality of parks, street lighting, pavements, etc.) may be factors. (Kemperman et al, 2019)



Henri de Toulouse-Lautrec, "The Bed," 1893, Musee d'Orsay, Paris. The subjective perception of loneliness can occur at any age, though it is more commonly experienced in old age. The presence of or physical contact with another person can modulate cardiovascular reactivity.  
Source: Wikimedia Commons/Public Domain



Edward Hopper, "The Automat," 1927. Hopper's image captures perfectly the isolation and presumed sense of loneliness and even depression of this woman. Des Moines Art Center, Des Moines, Iowa. Special thanks to Ms. Faust of Art Resource and Ms. Simon of Artists Rights Society for facilitating permission to use this image during the COVID19 crisis.  
Source: Copyright 2020, Heirs of Josephine N. Hopper/Licensed by Artists Rights Society (ARS), NY. Copyright DeA Picture Library, Art Resource, NY. Used with generous permission.

Research, though, on social isolation and loneliness, suffers from a “range of frameworks,” including a lack of clear definitions (e.g., “vague” age categories such as “older persons,” “elderly,” or “seniors”) or even whether the population is free-living in a community or in a residential home. (Fakoya et al, 2020)

Further, findings from studies are often difficult to integrate because of a heterogeneity of measures, ranging from assessment by asking a single question about the presence of loneliness to reliable and valid scales, such as the commonly used UCLA Loneliness Scale, with its 20 questions. (Beutel et al, *BMC Psychiatry*, 2017) "Central questions" become 'What aspects of someone's social connections should be measured and what dimensions are relevant?' (Lubben, *Public Policy & Aging Report*, 2017) And since loneliness is a *subjective* feeling, animal studies may have limited value. (Cacioppo et al, 2014)

Back in the late 1980s, House et al (*Science*, 1988) noted a “strong causal impact” of social relationships on health but acknowledged the possibility of reverse causality, namely whether a lack of social relationships causes people to become ill and die or whether those who are unhealthy less able to establish and maintain social relationships. Early studies were either cross-sectional or



observational. (House, 1988; Leigh-Hunt et al, *Public Health*, 2017) Over time, though, researchers have come to accept that a lack of social relationships constitutes a major risk factor for health, “rivaling the effects” of smoking, hypertension, increased lipid levels, obesity, and a lack of physical activity. In a review of reviews, spanning 1950 to 2016, researchers found consistent evidence that linked social isolation and loneliness to worse cardiovascular as well as mental health outcomes. (Leigh-Hunt et al, 2017) The “molecular mechanisms” for an increased cardiovascular risk, though, are still not well understood. (Xia and Li, 2018) Even the presence, though, of another person in the stressful context of an ICU, for example, was found to modulate cardiovascular activity. (House, 1988) More recently, isolation has been associated with compromising recovery in those patients who have had acute cardiac events: increased hospital readmissions and even premature death have occurred. (Alun and Murphy, *British Journal of Cardiac Nursing*, 2019) Evidence for an association of social isolation and loneliness with other physical conditions such as cancer or back pain, though, is less strong. (Leigh-Hunt et al, 2017)

In general, some researchers have suggested the hypothesis of *social control*, namely that those with connections to others are more apt to engage in better behavior and remain healthier. (House, 1988) Others have considered personality factors, such as introversion (i.e., low levels of social involvement with others) but that trait “rarely emerges as a strong risk factor for outcomes.” (Cacioppo et al, 2014)

Still other investigators have focused on the connection of loneliness and the physiological reactivity to acute stress. Studies, again, have produced conflicting results: some indicate that higher levels of loneliness lead to exaggerated physiological reactions, while others indicate those with high levels have a blunted reaction to stress. (Brown et al, *Psychophysiology*, 2018) Because loneliness is a risk factor for obesity, smoking, and negative eating patterns (e.g. binge eating), there is the suggestion that it has a role in “behavioral regulation” through dysregulation of the stress response. (Brown et al, 2018) There is even the suggestion that social ties are important to health because they buffer the impact of stress on the immune system. (Lubben, 2017)



Hans Thoma, "Loneliness," 1880. National Museum in Warsaw.  
Source: Wikimedia Commons/Public Domain



Copper engraving of Doctor Schnabel (i.e., Dr. Beak), a plague physician in 17th century Rome, after 1656. Protective equipment, when available, for physicians and other health professionals, has greatly improved since the 17th century.  
Source: Wikimedia Commons/Public Domain

Some have suggested that there are parallels between loneliness and obesity. For example, both make disproportionate demands on the health system; both may result in both physical and psychological illnesses; and both may result in an individual’s inability to “conform to prevailing social expectations,” i.e., to be locked “within their own boundaries”—“for morbid obesity, the body, and for loneliness, the mind.” (Alberti, 2019, p. 9)

Loneliness has also been found to be a risk factor for cognitive decline and even dementia (Holt-Lunstad, 2017) but again, it may be a consequence rather than a predictor. (Cacioppo et al, 2014) Studies have produced discrepant results, and it is possible that loneliness increases depressive symptoms and alters cognitive functioning through its effects on depression, including increased fragmentation of sleep. (Cacioppo et al, 2014)

Further, lonely people not only tend to be unhappy but also have a heightened sensitivity to threats, (Cacioppo et al, 2006) feel unsafe, and may be excessively vigilant. (Hawkey and Cacioppo, 2010) “Loneliness seems to be most detrimental to mental health while social isolation seems to be most detrimental to cognitive and

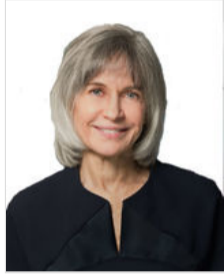
physical health.” (Beller and Wagner, *Health Psychology*, 2018) In a large German study of over 4800 people with a follow-up of 20 years, there were synergistic effects of loneliness and social isolation: the higher the social isolation, the larger the effect of loneliness on mortality, and the higher the level of loneliness, the larger effect of social isolation. (Beller and Wagner, 2018)

*Bottom line:* Objective social isolation and subjective feelings of loneliness (i.e., perceived social isolation) are associated with physical, particularly cardiovascular effects and cognitive impairments, as well as psychological effects such as depression. Research supports the notion that these work synergistically and result in increased morbidity and mortality, equivalent to the effects of smoking, obesity, and decreased physical activity. As people throughout the world are sheltering in place to avoid further spread of COVID-19, it behooves us all to be cognizant of the impact that social isolation and loneliness may have.

*Note: This is Part 2 of a two-part blog. Special thanks, again, to Judy Salerno, MD, MS, President of the New York Academy of Medicine, for suggesting this relevant and timely topic.*

## About the Author

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