

Measuring the weight of love: Have relationships deteriorated over time?

Chung (Christina) Cheuk

University of Pennsylvania

A Capstone Project Submitted

In Partial Fulfillment of the Requirements for the Degree of

Master of Applied Positive Psychology

Advisor: Dr. Martin E. P. Seligman

August 1, 2019

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Chung (Christina) Cheuk  
christina.cheuk@gmail.com

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### Abstract

We are healthier, richer, safer, and better educated than ever before. Yet paradoxically, depression is on the rise in the United States. Given the strong emphasis that positive psychology places on the importance of social relationships, I review direct and proxy evidence that relationships are deteriorating in the United States. Additionally, I outline next steps to strengthen this hypothesis. The implications of this work point toward a need to complement the joys of modernity with interventions and policies that support strengthening our weakened relationships.

*Keywords:* depression, well-being, social support, measuring relationships, quality of relationships, quantity of relationships, social network, social tie strength, positive psychology

### Acknowledgements

Thank you to my advisor, Dr. Martin Seligman. Marty is a legend and a true visionary of our time, who has helped the field of psychology and so many others learn to flourish. Most importantly, Marty is an individual who has changed millions of lives for the better. Thank you for your guidance and for sharing your knowledge throughout the Capstone process.

Thank you to the entire team behind the University of Pennsylvania's Master of Applied Positive Psychology program. My MAPP 14 classmates, the assistant instructors, professors, and administrators have made this an experience I could not be more grateful for. Special thanks to my #1 cohort, Alexandra Bono, Henry Ritchie, and Devon O'Malley. Additionally, special thanks to Leona Brandwene for her unwavering support, warmth, and love. Special thanks to Anna Lucas, Owen Harrison, and Emily Santos for the wisdom and Capstone reference leads.

Thank you to my family, Kim Cheuk, Andrew Seitz, and Skeeter. You are saints and I could not have done it without you.

Thank you to Alecia McGregor, Kris Trujillo, Elaine Angelino, Isabelle Richards, and Abigail Fischer for the brainstorming sessions and being a great outlet when I needed a break.

**Introduction: the Paradise Paradox**

We live in an unprecedentedly rich world by almost every measure of human progress. This is measured not just in terms of income per capita, material goods, and declines in extreme poverty, but we're healthier, live longer, are better educated, and are freer than ever before (Rosling, Rosling, & Rönnlund, 2018; Pinker, 2018). True, suffering abounds with 650 million people still living in extreme poverty (Roser & Ortiz-Ospina, 2019a) and another 263 million children are out of primary or secondary school when they should be (Roser & Ortiz-Ospina, 2019b). Even so, overall progress has been large-scale and undeniable. Paradoxically, depression has been on the rise in recent decades (Whitaker, 2010; Weinberger et al., 2018; Lim et al., 2018). How is it possible that in the objectively best world to date, more people are extremely unhappy than ever before? I will quickly explore a few existing theories on why depression is on the rise. I will explore foundations in positive psychology and review the impact of relationships on well-being. I will use direct and proxy measurements for measuring the deterioration in the quantity and quality of social relationships within the United States. Finally, I discuss implications and future research explorations.

**Background on Human Progress and Depression**

**Rise of Progress.** Human progress has been well documented with increasing access and transparency of information, tracking everything from infant mortality rate, to life expectancy, to disease rates, educational rates, crime rates, pollution, literacy, access to clean water and food, human rights, and labor trends. Gigantic data sets are available for almost everyone to access via sites like Gapminder, Google Public Data Explorer, World Bank Open Data, World Health Organization, Our World in Data, and ones specific to the United States such as the Census Bureau, Data.gov, Pew Research Center, and Healthdata.gov just to name a few. Yet even with

open access and easily used data visualization tools, the enormous progress has been muted among public opinion. In fact, within two months of each other, two leading thinkers published New York Times Bestsellers to shout the extraordinary advancements in human progress: Steven Pinker's *Enlightenment Now* (2018) and Hans Rosling's *Factfulness* (2018). Here are some of the highlights from a few domains of progress:

Since 1970, global gross domestic product per capita (adjusted to 2010 dollars) has risen 109% to \$10,882 (World Bank Group, 2019). In the United States, GDP per capita has risen 135% to \$54,542 (World Bank Group, 2019). The extreme poverty rate, measured by the share of humanity living on less than two dollars a day, has fallen from 85% at the turn of the nineteenth century down to 50% in 1966, and just fell to 9% in 2017 (Rosling et al., 2018). Average life span in 1800 was 29 years, with no countries above 40 years (Roser, 2018). In 1950, life expectancy rose to 46 years, and reached 71 years in 2015. A large part of this was driven by lower child mortality rates, from 44% of children dying before their fifth birthday in 1800 to 4% in 2016 (Rosling et al., 2018). The United States was no exception, with life expectancy rising from 39.4 in 1800, to 68.1 in 1900, and 78.8 in 2015 (Gapminder, 2019a). Similarly, child mortality rates dropped in the United States from 32.9% in 1800 to 6.5% in 2016 (Gapminder, 2019b).

Only three countries now legally allow slavery, down from 193 of 195 countries in 1800 (Rosling et al., 2018). Literacy among adults age 15+ with the basic skills to read and write spiked from 10% in 1800 to 86% in 2016 (Rosling et al., 2018). Environmentally speaking, we've moved from 1,663 thousand tons of ozone-depleting substances used in 1970 down to 22 thousand tons in 2016, and the share of Earth's land surfaces protected as national parks and reserves has increased from 0.03% in 1900 to 14.7% in 2016 (Rosling et al., 2018). Similarly in

the United States, we have slashed our emissions of air pollutants by almost two-thirds since the establishment of the Environmental Protection Agency in 1970 (Pinker, 2018). Energy consumption has leveled off even though our population grew by more than 40% and vehicle miles are twice as high (Pinker, 2018).

The story of progress continues across decreasing crime rates ranging from homicide to domestic violence, rape and sexual assault (Pinker, 2018). Even in terms of subjective viewpoints, we've made progress. Fewer people agree with the following statements: school boards should have the right to fire homosexual teachers, women should return to their traditional roles in society, and interracial dating is unacceptable (Pinker, 2018). In short, almost everything measurable about human progress is getting better.

**Rise of Depression.** *Almost* everything is getting better. Depression is a glaring exception, especially within the last few decades. Seligman (1989) drew upon two major epidemiological studies to conclude the rate of depression has been on the rise since roughly the end of World War II, increasing to approximately ten times the previous risk. However, two longitudinal studies found a similar or slightly lower rate of depression between the late 1940s and 1990s. The Stirling County Study (Murphy, Laird, Monson, Sobol, & Leighton, 2000), which followed cohorts across 1952, 1970, and 1992, found depression rates were fairly stable between all cohorts. However, the study did note women dominated depression rates among those born after World War II, which may indicate an increase specific to women only. The Lundby Study, which followed subjects over 1947-1972 and 1972-1997, found the latter cohort had lower incidence and cumulative rates of depression, suggesting depression was not increasing (Mattison, Bogren, Nettelbladt, Munk-Jørgensen, & Bhugra, 2005). However, since the mid-1990s, the trend towards rising depression is much clearer and less debatable.

One meta-analysis of 90 studies involving over 1.1 million adults in over 30 countries found the lifetime prevalence of depression was 9.8% between 1994 and 2003, which increased significantly to 15.4% between 2004 and 2014 (Lim et al., 2018). Within the United States, an analysis of data drawn from 607,520 respondents on the National Survey on Drug Use and Health found past-year depression rose significantly between 2005 and 2015, from 6.6% to 7.3% (Weinberger et al., 2018). Even more alarmingly, the largest contributor to this rise was from twelve to seventeen year olds, from 8.7% in 2005 to 12.7% in 2015. Similarly, a survey of over half a million adolescents grade eight through twelve also reported a 33% increase in depressive symptoms between 2010 and 2015, driven almost exclusively by females (Twenge, Joiner, Rogers, & Martin, 2018). It is clear we are currently in an epidemic, with alarmingly increasing rates of depression, especially for adolescent women. This is similarly reflected by the United States Department of Health and Human Services data—Table 1 shows the prevalence of mental illness and major depressive episodes significantly increasing in all under 26 age groups.

TABLE 1. Mental Health by Age Group in the United States

| In the past year...             | Age Group | 2008-2009 | 2016-2017 | P Value |
|---------------------------------|-----------|-----------|-----------|---------|
| Serious mental illness          | 18+       | 3.70      | 4.38      | 0.000   |
|                                 | 18-25     | 3.55      | 6.68      | 0.000   |
|                                 | 26+       | 3.72      | 4.01      | 0.057   |
| Any mental illness              | 18+       | 17.92     | 18.57     | 0.022   |
|                                 | 18-25     | 18.25     | 23.93     | 0.000   |
|                                 | 26+       | 17.86     | 17.69     | 0.584   |
| Had serious thoughts of suicide | 18+       | 3.73      | 4.19      | 0.000   |
|                                 | 18-25     | 6.42      | 9.64      | 0.000   |
|                                 | 26+       | 3.26      | 3.31      | 0.759   |
| Major depressive episode        | 12-17     | 8.22      | 13.01     | 0.000   |
|                                 | 18+       | 6.53      | 6.89      | 0.032   |
|                                 | 18-25     | 8.21      | 11.95     | 0.000   |
|                                 | 26+       | 6.24      | 6.07      | 0.367   |

*Note:* U.S. Department of Health and Human Services, SAMHSA. *National Survey on Drug Use and Health: Comparison of 2008-2009 and 2016-2017 Population Percentages, 2018.*

**Existing Theories.** There are a few notable theories as to why depression is on the rise. One theory is that depression and mental illness are more socially acceptable than it used to be, resulting in more people seeking help and becoming clinically diagnosed with depression. Whitaker (2010) attributed the fivefold increase in the percentage of Americans disabled by mental illness between 1955 and 2005 as the result of a Prozac-era in which our population is over-medicated. While a 2018 BlueCross BlueShield report on depression did note a 33% increase in clinical diagnoses of major depression since 2013, self-report measures also note an overall and significant increase (Weinberger et al., 2018). This indicates the problem runs deeper than merely more people finally being diagnosed for existing depression.

Another theory involves negativity bias and the availability heuristic (Tversky & Kahneman, 1973). This line of thinking is rooted in cognitive theories of depression, in which people's thoughts, inferences, attitudes, and interpretations can increase risk for depression (Gotlib & Joormann, 2010). Negativity bias refers to how humans and animals have evolved to give greater weight to negative entities and events (Rozin & Royzman, 2001) and has been linked as a risk marker of depression (Watters & Williams, 2011). However, given the long evolutionary basis for negativity bias, it's unclear why the last few decades have driven a marked increase in depression. Furthermore, Fredrickson's (2001) broaden and build theory also posits we have similarly evolved to experience positive affect which helps us build resources over time. Given the increasing peace and prosperity around the world and the slow pace of evolution, it is unlikely negativity bias has increased so significantly in the last few decades as to explain the full rise in depression rates.

The availability heuristic refers to our tendency to evaluate probability of events by the ease with which we recall relevant events (Tversky & Kahneman, 1973). Negative events are



more available to us for two reasons. First, newspapers are more likely to publish bad news than good news (Stone, Hartung, & Jensen, 1987), and there has been a trend towards a more negative tone of news since 1945 (Leetaru, 2011). Importantly, this downward trend was measured as a standard deviation of the mean tone. Overall, the tone of news, especially in discussion of the United States, was still more strongly positive in tone than negative (Leetaru, 2011). Second, news consumers pay more attention to negative headlines than positive ones (Trussler & Soroka, 2014). However, a 2006 study of information processing of broadcast news found male viewers are associated with negativity bias, are more aroused by negative news, and produce the best recognition memory and comprehension scores for negative news, while female viewers showed signs of avoiding negatively framed news, found positive news more arousing and processed positive news more effectively (Grabe & Kamhawi, 2006). Since women are twice as likely as men to experience depression from early adolescence through adulthood (Nolen-Hoeksema, 2001), it is again unlikely the availability heuristic is the primary driver of rising depression rates.

A final notable theory is the cumulative effect of modern life as the primary driver of increased depression rates. Seligman (1989) has described this effect as the rise of individualism due to the ever rising market for customization and the prosperity to make those choices. Furthermore, Seligman (1989) describes the assassination of multiple leaders such as Martin Luther King Jr., Malcolm X, and Robert Kennedy combined with the Vietnam War, and the loss of God and family as the primary themes leading to the self as a focal unit. Hidaka (2012) noted a correlation between national GDP per capita and the lifetime risk of a mood disorder. He further associated the rise of depression to eating too much yet not getting enough nutrition, remaining sedentary, not getting enough sunlight nor sleep, and being socially-isolated. Twenge

(2017) likewise blames modernity, with a focus on screen time and social media as primary perpetrators. I believe the idea underlying these modernity themes is that all have a negative impact on social relationships. In the next sections of the paper, I will review the literature regarding social relationships and well-being, and then revisit the modernity theory through the lens of measuring the deterioration of social relationships in the United States. However, to understand well-being, we must first take a high-level view of what constitutes well-being.

### **Positive Psychology**

**The Beginning.** As the human progress journey has shown, the bad things in the world are largely decreasing. This should mean the good is necessarily advancing. However, the major insight positive psychology is built upon is that the absence of the bad does not necessarily equate to the presence of the good. Shortly after being elected American Psychological Association president, Seligman (2018) had a “lightning bolt” conversation with his five year old daughter, Nikki (p. 3). Nikki convinced him if she could stop whining, then her father could surely stop being so grouchy. This led Seligman to two insights: his successes may be *in spite of* rather than due to his flaws, and instead of correcting Nikki’s errors, he should instead look for and build upon her strengths. In the first week of 1998, Seligman (2018) gathered with two close colleagues, Mihaly Csikszentmihalyi and Ray Fowler, and their spouses, to develop the seeds of positive psychology as a field. The idea was to empirically study the opposite of clinical psychology, which has traditionally focused on curing what ails us—depression, anxiety, psychiatric disorders (Lopez & Gallagher, 2009). Instead, Seligman and his colleagues wanted to study what enables the achievement of the good life. From there, it was off to the races with initial funding from Seligman’s whole APA presidential allotment, and grants from the John Templeton Foundation and the Atlantic Philanthropies. Positive psychology was officially

launched by the end of 1999 (Seligman, 2018).

**Definition.** Importantly, positive psychology distinguishes the concept of hedonia and eudaimonia (Deci & Ryan, 2008). Hedonia refers to happiness, or the general presence of positive affect and the absence of negative affect (Deci & Ryan, 2008). Eudaimonia, a term originally used in Greek philosophy, refers to the effort and ability to live in accordance with one's sense of excellence and potential (Waterman, 1993). In describing positive psychology, Christopher Peterson (2008) wrote:

Positive psychology is the “scientific” study of what makes life most worth living. It is a call for psychological science and practice to be as concerned with strength as weakness; as interested in building the best things in life as in repairing the worst; and as concerned with making the lives of normal people fulfilling as with healing pathology. (p. xxiii)

By complementing traditional clinical psychology, positive psychology has greatly advanced our understanding of what it means to thrive and achieve well-being through frameworks such as Diener's (1984; 2000) Subjective Well-Being, Seligman's (2011) PERMA, and Prilleltensky's (2016) I COPPE, among several others.

**Well-Being Theories.** Subjective-Well Being, or SWB, is a measure of people's overall evaluations of their own lives (Diener et al., 2017). It is made of three primary components: satisfaction with life, the presence of positive affect, and the absence of negative affect. The first component, satisfaction with life, is measured using the Satisfaction with Life Scale (SWLS), a self-report Likert-type scale measuring how much individuals strongly agree or disagree with statements of global life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). A key to the development on this measure was the idea that although an individual could be objectively well-off, such as having a high income, good job, family, and the accumulation of material wealth, his

evaluation of his life could be negative. Indeed, income and well-being are correlated only to a certain degree—once needs are met, greater income does not necessarily bring greater happiness (Diener, Sandvik, Seidlitz, & Diener, 1993). In fact, in the United States, income and happiness only correlate 0.13 (Diener et al., 1993).

Another major insight of positive psychology is that happiness and well-being can be increased. This is contrary to Brickman and Campbell's (1971) idea of the hedonic treadmill in which momentary events and changes in your situation only affect happiness temporarily before returning to a base neutral state. Instead, Diener, Lucas, and Scollon (2006) advance the idea that the search for well-being isn't fruitless. People have multiple set points across different domains such as work, life, home, positive affect, and negative affect which may change over time, though at variable rates across individuals, due to both external circumstances and internal events (Diener et al., 2006). Knowing it is possible and being able to measure SWB is not enough—we must also understand *how* to increase SWB.

In *Flourish*, Seligman (2011) summarizes his PERMA theory, which identifies the core building blocks of SWB and provides insight into pathways for well-being. PERMA stands for positive emotion, engagement, positive relationships, meaning, and achievement. Each element meets the criteria of contributing to well-being, is pursued as its own end goal, and is defined and measured independently of the other elements (Seligman, 2011). In designing and studying PERMA, Seligman (2011) notes very little that is positive is solitary—the high points in our life typically take place around other people. In fact, Seligman (2011) describe other people as “the best antidote to the downs of life and the single most reliable up (p. 20).”

Other positive psychology frameworks for well-being also note the importance of positive relationships. Prilleltensky et al., (2015) I COPPE measures domains, including

interpersonal, community, occupational, physical, psychological, and economic areas of well-being. Interpersonal relationships refer to our evaluations of the relationships that matter to us (Prilleltensky et al., 2015). In fact, the quality of our interactions is correlated with our overall physical, psychological, and occupational well-being (Prilleltensky, 2016). Similarly, Ryff's (1989) framework includes positive relations with others, along with self-acceptance, environmental mastery, purpose in life, and personal growth. Ryan and Deci's (2000) self-determination theory points at relatedness as one of three innate psychological needs that allow for enhanced self-motivation. Even Maddux' (2009) article on self-efficacy could not conclude without a few final notes on the idea of collective efficacy due to the great importance humans place on social relationships. Maddux (2009) included the idea of a group's shared belief in its capabilities due to the emphasis on the social embeddedness of individuals.

Positive psychology, or the study of individual and organizational flourishing (Seligman, 2011), paints one clear arrow: individuals need healthy and positive social relationships to thrive.

### **Relationships and Well-Being**

**Definitions and Scope.** We have many types of social relationships: friends, family (through kin or marriage), neighbors, associates, and romantic partners. These can be casual or intimate, weak or strong. Granovetter (1977) introduces the concept of a tie strength, the combination of time, emotional intensity, and intimacy shared between the individuals. Relationships can also be dyadic, triadic, and group structures. Although Haidt, Seder, and Kesebir (2008) have theorized humans may need to lose their individualized selves in a social group in order to reach the highest levels of well-being, I will focus the scope of this review on dyadic relationships from a quantitative and qualitative standpoint.

Barger (2013) defined relationship quantity as the degree of social integration and quality

as the perceived social support from these relationships. Social integration refers to the total network participation of an individual—this is generally measured in terms of the diversity of relationships a person participates in, such as romantic partner, close family member, friend, neighbor, social or religious group members, among others (Berkman & Glass, 2000). The more types of relationships present, the greater the level of social integration (Berkman & Glass, 2000). In addition to social integration, I will review changes in the total number of relationships of any type. Social support refers to both measures of perceived support, or the perception others will come to one's aide, as well as enacted support, or the actual support given or received in response to a stressor (Vangelisti, 2009). In addition to social support, I will review changes in perceived relationship quality.

**The Positive Side of Relationships.** The need to belong is a fundamental need and motivation (Baumeister & Leary, 1995). As a result, individuals are motivated to form and maintain strong, stable interpersonal bonds. A landmark study found good social relationships are ubiquitous among extremely happy people. Though not enough by itself to ensure extreme happiness levels, strong relationships were a requirement for becoming very happy (Diener & Seligman, 2002). In fact, a replication of this study of the happiest people in the world indicated the happiest people had the highest social wealth as measured by being treated with respect, being able to count on others to help, and average daily hours with friends and family (Diener, Seligman, Choi, & Oishi, 2018). This relationship between social wealth continued with moderately happy individuals with the next highest social wealth, and half of the unhappiest group with no social support (Diener et al., 2018). Individuals report their happiest days are days where they spend six hours or more socializing (Beuttner, 2017). More than happiness, close relationships are often cited as the most significant or meaningful areas of life (Sears, 1977).

Beyond merely fulfilling a basic need, positive social relationships are linked with greater positive affect (Moore, Diener, & Tan, 2018), better physical (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997) and mental health (Chiao, Weng, & Botticello, 2011). Some of these relationships have been shown to be bi-directional. High positive affect increases social relationships, but strong social relationships in turn increase positive affect (Moore et al., 2018). This makes sense as people are driven to be more social when they are in a good mood, but also derive great joy from interactions with loved ones. Similarly, high SWB improves social relationships, but social relationships are also a major cause of SWB (Diener & Seligman, 2002). A meta-analysis of 148 studies found social relationships influenced the risk of mortality at similar levels to smoking and alcohol consumption (Holt-Lunstad, Smith, & Layton, 2010). The same meta-analysis found there was an overall 50% increased likelihood of survival against mortality risk when strong social relationships were present. This is likely related to the association of more diverse social networks with greater immunity to infectious disease (Cohen et al., 1997) and better cardiovascular health (Eng, Rimm, Fitzmaurice, & Kawachi, 2002).

Researchers have hypothesized that the perceived availability of social support directly affects health by buffering the negative effects of stress (Cohen, 2004; Holt-Lunstad et al., 2010). Social support refers to the social resources a person believes is available or actually provided by individuals and is often associated with stressors like illness, transitions, and addiction (Berkman & Glass, 2000). Stress-buffering is the idea that individuals who perceive social support and belongingness as having protection from stress and risk related to life events (Cohen & Wills, 1985). Gottlieb (1978) categorized four types of informal helping behaviors that make up social support. First, there are emotionally-sustaining behaviors, including providing reassurance, encouragement, listening, signaling understanding, respect, concern, trust, and intimacy.

Second, there are problem-solving behaviors including providing clarifications, allowing venting, suggestions, directives, information about the source of stress, and modeling helpful behaviors. Third, there are indirect personal influence factors like reflecting unconditional access or readiness to help. Finally, there are actions that alter the environment or circumstance, including examples such as convincing landlords to wait longer for money due. However, there is also evidence that individuals share more good news than bad news (Gable & Gosnell, 2011; Gable, Gonzaga, & Strachman, 2006), in a process called *capitalization*. Yet another way positive relationships aid individual well-being is through influencing personal beliefs. Participating in social groups can influence the way we think, our emotions, behaviors, and biological responses. That may in turn change self-esteem, self-worth, and self-efficacy (Berkman & Glass, 2000). Together, these findings show positive relationships are foundational to well-being.

**The Negative Side of Relationships.** Not everything is wonderful about having relationships. More relationships provide more opportunities for negative interactions as well when people physically or emotionally hurt each other (Rook, 2015). Examples include inadequate or failure to provide support, rejection, neglect, misdirected control, or undermining healthy behaviors, such as by pushing individuals to binge drink (Rook, 2015). Additionally, negative characteristics may spread through a social network. In a subset of the Framingham heart study, Christakis and Fowler (2007) found a person's chance of becoming obese increased by 57% if he had a friend who became obese in a given interval of the study. If one spouse became obese, the likelihood the other spouse would also become obese increased by 37%. However, these negative consequences pale in comparison to the negative consequences of social isolation. Poor-quality relationships or a lack of social ties are associated with poorer



functioning cardiovascular, immune, and endocrine systems, and increases in mortality (Berkman & Syme, 1979; House, Landis, & Umberson, 1988; Uchino, Cacioppo, & Keicolt-Glaser, 1996). In some cases, poor interpersonal well-being leads to depression.

**Relationships and Depression.** Depressive symptoms are linked to having fewer close relationships, smaller social networks, and perceived inadequacy of social support (Barnett & Gotlib, 1988). This association begins in adolescence and continues through old age (La Greca & Harrison, 2005; Murphy, 1982). In fact, people at the periphery of their social networks are less likely to be happy than those at the core (Fowler & Christakis, 2008). Even more worrisome, depression also spreads through social networks. In an analysis of the Framingham Heart Study, researchers found high depression scores were strongly correlated with similar scores in friends and neighbors, up three degrees of separation (Rosenquist, Fowler, & Christakis, 2011). Female friends were especially susceptible to the spread of depression.

The link between poor social relationships and depression appears to be bi-directionally causal as well. Depression causes poor social relationships due to increased negative self-statements, repeatedly seeking reassurance, and social inadequacy (Joiner & Timmons, 2002; Rudolph, Flynn, & Abaied, 2008). Another study of almost 2,500 adolescents ages eleven to seventeen found depression influenced peer support significantly and negatively (Ren, Qin, Zhang, & Zhang, 2018). A study of 421 adolescents found negative qualities of best friendships and romantic relationships predicted depressive symptoms (La Greca & Harrison, 2005). In a five-year cross-lagged analysis of loneliness and depression, researchers found loneliness predicted depressive symptoms but not vice versa (Cacioppo, Hawkley, & Thisted, 2010). In another longitudinal study, Eberhart and Hammen (2006) followed college women with no history of depression every six months for four years. The researchers found that even after

controlling for baseline depressive symptoms and various demographics, poorer family relationship quality predicted the onset of depressive episodes. These results were not just limited to kin. Poor peer relationship quality, difficulty being close to others, and difficulty depending on others also predicted depressive symptoms. Another study, which tested social engagement as a positive intervention for depression, found higher levels of social engagement led to fewer depressive symptoms, and participants who self-identified as having positive social engagement growth reported reductions in depressive symptoms (Lou, Chi, Kwan, & Leung, 2012). Similarly, an eighteen-year longitudinal study of senior citizens over the age of 65 found social participation reduced depressive symptoms and both starting participation later in life and continuous participation led to fewer depressive symptoms (Chiao et al., 2011).

There is a strong correlational and causal link between low interpersonal well-being and depression. Depression is on the rise in the United States. This points to the possibility that while life in the United States is getting better among most objective measures like income and health, deterioration in relationships may be driving the rise in depression and depressive symptoms. To evaluate this hypothesis, I will review evidence that the quantity and quality of American relationships are deteriorating.

### **Measuring Declines in Relationship Quantity**

**Overall Core Network Size.** Over the last three decades, core social networks have decreased by roughly a third, from an average of three to only two close ties (McPherson, Smith-Lovin, & Brashears, 2006; Hampton, Sessions, & Her, 2011; Brashears, 2011). A social network refers to the social connections of an individual. Connections can be direct ties to a specific individual, or can include indirect ties up to a certain degree of separation (i.e. the friend of a friend). For the purposes of my review, I will limit our definition of social networks to the

number of direct dyadic relationships present in an individual's life in which the relationship is maintained enough to depend upon for capitalization and social support.

One way this is measured is through the General Social Survey (GSS). The GSS began in 1972 and surveys Americans and American trends related to the attitudes, behaviors, and attributes of society (General Social Survey [GSS], 2016). In 2006, McPherson and colleagues examined the GSS surveyed changes between 1985 and 2004 in core discussion networks, defined as the number of people individuals felt they could talk to about important matters. They found mean network size decreased from 2.94 to 2.08, or almost one fewer tie per person. This held true for both kin and non-kin confidants. Overall social isolation, as measured by having zero discussion partners, increased from 8.1% to 22.5% (McPherson et al., 2006).

These findings were replicated in a random-digit dial survey of 2,512 adults (Hampton et al., 2011). Researchers found the size of core networks declined to 1.93 confidants per person, within both kin and non-kin connections. Social isolation did not increase as much in the 2011 study—but still rose 50% from 8.1% to 12.0%. To test for possible manipulation by survey structure, these findings were replicated a third time using a computer-assisted self-interview method in which respondents took a survey weekly (Brashears, 2011). In this study, respondents were manipulated in a few ways. Some received training indicating each named confidant would result in a lengthier survey, while others were primed to think directly about their social ties. The average core network size in this study was 2.03, again similar to the previous findings. One difference in this study was the finding that social isolation did not increase over the decades. However, the modal number of core ties was one confidant, with almost half of respondents answering with only one name.

While both kin and non-kin core ties decreased during this time period, non-kin ties were

disproportionately affected. Mean core ties of kin decreased from 1.44 to 1.12 confidants, while mean core ties for non-kin decreased from 1.42 to .88 (McPherson et al., 2006). However, examining subsets of relationships (family, romantic partners, and friends) will provide more clarity to the overall decrease in the quantity of social relationships.

**Family and Households.** Family and household size are decreasing. In 1800, each woman of reproductive age averaged just over seven babies in the United States (Gapminder, 2019c). By 1950, this fell to just over three children per woman, then to just over two children per woman in 1990, and to 1.9 in 2018. As fertility declines, the number of possible kin connections such as siblings, aunts, uncles, and cousins also decline.

Overall, average household size has fallen slightly, from 2.63 in the early 1990s down to 2.54 in the last three years (United States Census Bureau, 2019a). While this doesn't represent a huge decline, the increase of one person households drive much of this change—from 24.6% of households in 1990 up to 28% in 2018. Around 1850, almost 70% of Americans over 65 years of age lived with children (Ruggles, 2007). By 2000, fewer than 15% did so. However, there has been a 30% increase in proportion of children living in three-generational households between 2001-2012 (Carlson, Meyer, Dunifon, Ziolo-Guest, & Kopko, 2014). It is important to note, though, that the three-generational household group experienced unstable living arrangements during this time. The modal pattern for children in such a household was only one time during five waves of data collection over nine years. These individuals were also more likely to be single-parent households, even though a grandparent was present. This suggests three-generational households are likely to be temporary arrangements due to hardship and financial need, rather than the true growth of generations present in households among the last couple of decades.

While kin and household size have declined, there is no strong evidence that frequency of contact between kin and household members have similarly declined. The proportion of Americans living close (about 25-30 miles) to their adult children have stayed consistent between 60-75% from 1962 to 2013 (Crimmins & Ingegneri, 1990; Choi, Seltzer, Schoeni, Wiemers, & Hotz, 2018). One analysis of International Social Survey Data found face-to-face contact with mothers increased 32% in the United States between 1986 and 2001, though face-to-face contact with fathers decreased 9% (Kalmijn & De Vries, 2009). These trends were directionally similar, though slightly lower in magnitude for other types of contact. Young Americans are also less likely to go out without their parents, a shift beginning in the mid-1990s and accelerating in pace from 2006-2016 (Twenge, 2017). In summary, while there has been a decrease in the size of kin and household networks, there is no evidence that frequency of contact or distance between immediate kin has declined over time.

**Romantic Partners.** The proportion of married individuals in the United States has dwindled in the last few decades. In 1990, 60.7% of the population was married, while only 53.4% reported the same in 2018, a difference of seven percentage points (United States Census Bureau, 2019b). However, some of this is counteracted by an increase in unmarried individuals living with a partner—from 3.1% in 1990 to 7.7% in 2018 (United States Census Bureau, 2019c). The largest driver of fewer marriages is the increase in marital age, from 26.1 for men in 1990 to 29.8 in 2018, an increase of 3.7 years (United States Census Bureau, 2019d). Female age at first marriage similarly increased, from 23.9 to 27.8, an increase of 3.9 years across the same time frame.

Americans are also less likely to have a steady romantic partner even beyond the scope of shared households. According to the General Social Survey (2019a), 28% of adults reported not

having a steady partner in 1986, which rose to 35% in 2018. The subsets driving the majority of this trend were 18-34 year olds and 50-64 year olds. For young adults between 18-34 years old, 31% reported they did not have a steady partner in 1986, which increased to over half at 51% in 2018. For 50-64 year olds, this number rose from 21% to 26%. Teenagers, between eighth and twelfth grade are less likely to go out on dates. This trend began in 1988 but accelerated since 2009, from close to 90% of high school seniors going out on dates to slightly over half, and from over half to a third for eighth graders (Twenge, 2017).

Americans are also having less sex across all ages. In an analysis of the General Social Survey between 1989 and 2014, Twenge, Sherman, and Wells (2017) found adults had sex about nine fewer times per year. This trend was steady across all age groups, with the largest decreases in those ages 18-29 and 50-59. According the Centers for Disease Control and Prevention (CDC) National Youth Risk Behavior Survey (2016), more teenagers in ninth through twelfth grade reported not ever having sexual intercourse, from 54.1% in 1991 down to 41.2 in 2015. Within the three months before the survey, 37.5% of high schoolers reported being currently sexually active in 1991, down to 30.1% in 2015. Overall, fewer Americans are in steady romantic relationships and having sex less frequently over the last three decades.

**Friends.** Americans are spending less time socializing with friends, though this is confounded somewhat by the rise in social media use. Americans over age fifteen currently spend 53.9% of leisure time watching television, while time socializing or communicating per day has dropped from 46 to 39 minutes per day between 2003 and 2017 (United States Bureau of Labor Statistics, 2019). The percentage of respondents in the General Social Survey noting they had a friend they could discuss important matters with dropped from 73.2% in 1985 to 50.6% in 2004 (McPherson et al., 2006). Additionally, the percentage of respondents noting they had a

coworker who could be a confidant dropped from 29.4% to 18.0% within the same time period (McPherson et al., 2006; Kacperczyk, 2011).

In *Bowling Alone*, Putnam (2000) described declining social capital in America since the 1970s, after a period of increase between 1900 and late 1960s. Americans became less likely to have political and civic participation, religious participation, workplace networks, informal networks, mutual trust, and altruism (Putnam, 2000). This trend did reverse for almost a decade in terms of political participation and volunteerism among youth after the September 11<sup>th</sup>, 2001 terrorist attacks (Sander & Putnam, 2010). However, since the rise of the smartphone circa 2009, American youth is spending much less time on in-person social activities. Some researchers have found adult friendships (both online and in-person) continue to be abundant among Americans between the ages of 25 to 74, and in fact grew between 2002 to 2007 (Wang & Wellman, 2010). These researchers often cite that heavy Internet users have more friends both online and offline. However, Twenge (2017) notes this phenomenon is more related to extroverts having broader social networks than the internet being a useful socialization tool. Instead, Twenge emphasizes the decline in in-person social activities.

The percentage of eighth, tenth, and twelfth graders getting together with friends multiple times a week dropped drastically from almost half in the 1990s, down to a little over 40% in 2010, down to less than a third in 2015 (Twenge, 2017). The percentage of high school seniors spending time with in-person social activities with friends dropped from over 50% in 2006 down to just under 40% in 2015 (Twenge, 2017). Time partying and socializing with friends among American college freshmen dropped from 37.9% of students socializing at least 16 hours per week with friends in 1987 to only 18% in 2014 (Eagan et al., 2014).

Americans spend less time with neighbors. In the 1970s, almost 30% spent time with

neighbors and less than 20% had no interactions. Today, this proportion has reversed (Cortright, 2015). Americans reporting they had a neighbor they could discuss important matters with dropped from 18.5% in 1985 to 7.9% in 2004 (McPherson et al., 2006). Americans reporting they had a co-member of a group or an organization who could be a confidant dropped from 26.1% to 11.8% (McPherson et al., 2006).

Overall, there is notable evidence Americans have fewer close social relationships and spend less than socializing than three decades ago. However, deterioration in the quantity of relationships is only half the picture. Certainly, quantity of relationships is important. Larger networks tend to provide more support (Seeman & Berkman, 1988), especially for women (Stokes & Wilson, 1984). In one analysis of thirteen network structure variables including size, number of confidants, dominance of relatives, density of network by relationship type, Stokes (1983) found only the number of confidants in the network was related to satisfaction with social support. Time together is correlated with relationship satisfaction, although the direction of causality is unclear (Guldner & Swensen, 1995). However, a study of long distance romantic relationships compared to geographically proximal relationships, time together was not significantly associated with relationship quality on measures of relationship satisfaction, intimacy, trust, and commitment (Guldner & Swensen, 1995). Similarly, Johnson (2001) found no significant differences in long-distance friendships versus geographically close friends in terms of satisfaction or perceived closeness within the dyad. In order to gain a more thorough understanding of changes in American social relationships, I will also review evidence of the deterioration of relationship quality.



### **Measuring Deterioration in Relationship Quality**

**Defining Quality.** There are several ways to define the quality of a relationship. Wellman (1992) introduced the idea of strong and weak tie strength in social relationships, which are linked to receiving interpersonal social support. Strong tie relationships are characterized by a sense of the relationship being intimate and special, a voluntary investment, and a desire for companionship between the individuals. Furthermore, the relationship is marked by a sense of mutuality, with each tie's needs not only known but supported. Wellman adds a final dimension of an interest in being together as much as possible through frequent interactions within multiple social contexts over a long period of time. However, the emphasis is on the desire to have frequency and variety rather than actual time spent together. Moore, Diener, and Tan (2018) define three characteristics of high-quality social relationships. First, the relationship is pleasant and rewarding, free of chronic negative thoughts and feelings. Second, the relationship is close and supportive, with mutual reliance on emotional and physical support. Third, the relationship tends to be long-lasting, which helps build ongoing social resources and security. Researchers have gone further than simply defining relationship quality; they have also created and tested a number of scales and inventories to measure quality. Here is a brief overview of just a few notable ones that measure a variety of dyadic relationship types.

The Relationship Assessment Scale (RAS) was developed by Hendrick in 1988 as a seven-item Likert measure of general marital satisfaction. It is based on how well needs are met, how it compares to others, existing regrets, and whether one's expectations have been met in terms of love for each other and problems in the relationship.

The Dyadic Trust Scale (DTS) measures participants' trust in their partner with an eight-item Likert scale (Larzelere & Huston, 1980). Results on this scale is correlated with love and

with intimacy.

The Personal Assessment of Intimacy in Relationships (PAIR) assesses five types of relationships (Schaefer & Olson, 1981). These dimensions include: emotional intimacy (the experience of closeness, ability to share, existence of genuine understanding and supportiveness), social intimacy (the experience of having a similar social network), sexual intimacy (the experience of physical affection, proximity, and sexual activity), intellectual intimacy (the experience of sharing ideas, talking about life events, discussing job-related issues, and current affairs), and recreational intimacy (shared interest in hobbies, mutual participation in clubs, sports, and mutual leisure activities).

The Social Support Questionnaire (SSQ) measures the perceived number of social supports and the satisfaction with social support available (Sarason, Levine, Basham, & Sarason, 1983). The SSQ has shown social support is more strongly related with positive than negative life changes. This finding is supported by Gable, Gonzaga, and Strachman (2006), who found positive emotional exchanges are even more closely related to relationship well-being than negative event discussions. Questions on the SSQ includes measures of who an individual can count on to listen, help, be dependable, be yourself around, appreciate, and console.

Hassebrauck and Fehr (2002) defined scales for four measures of relationship quality: intimacy, agreement, independence, and sexuality. These scales were correlated with indicators of close marital relationships, including commitment, trust, and love.

For the purposes of this review, I will define relationship quality as any measure indicating closeness and intimacy, presence of adequate social support, and overall satisfaction with a given relationship.

**Review of Existing Measures of Relationship Quality.** Many researchers have studied the interaction between relationship quality and various outcomes, such as marital stability, health, self-esteem, social adjustment, and depression. Some of those have been recounted earlier in this paper. Very few measure changes in relationship quality and satisfaction. One attempt to do so focused on marital quality across two generations based on responses to the General Social Survey (Rogers & Amato, 1997). These researchers found both younger men and women reported lower levels of marital interaction and significantly higher levels of marital conflict in 1981 to 1992 as compared to 1969 to 1980. Since this decline, the percentage of participants rating their marriage as “very happy” or “not too happy” have remained relatively stable between 1990 and 2018 (GSS, 2019b).

As for satisfaction in friendships, Fischer (2011) compiled data from 1970 to 2005 from three data sources. Two of these indicators, the General Social Survey measure of individuals deriving a “very great deal of satisfaction” from friendships and the Gallup measure of closeness of friendships indicated no significant changes in friendship satisfaction. One indicator, the Roper measure of being “completely” satisfied showed a consistent negative trend between 1975 and 1994, all available years of data. Fischer (2011) also compiled the percentage of respondents that indicated people are helpful, fair, and can be trusted. Across 1970 to 2006, there was a decline in all three indicators.

In the existing literature, there are only weak indications that the quality of marital relationships and friendships are declining or remaining stable in the last few decades. However, this is based on very few studies, all of which are based on self-reported sentiment surveys.

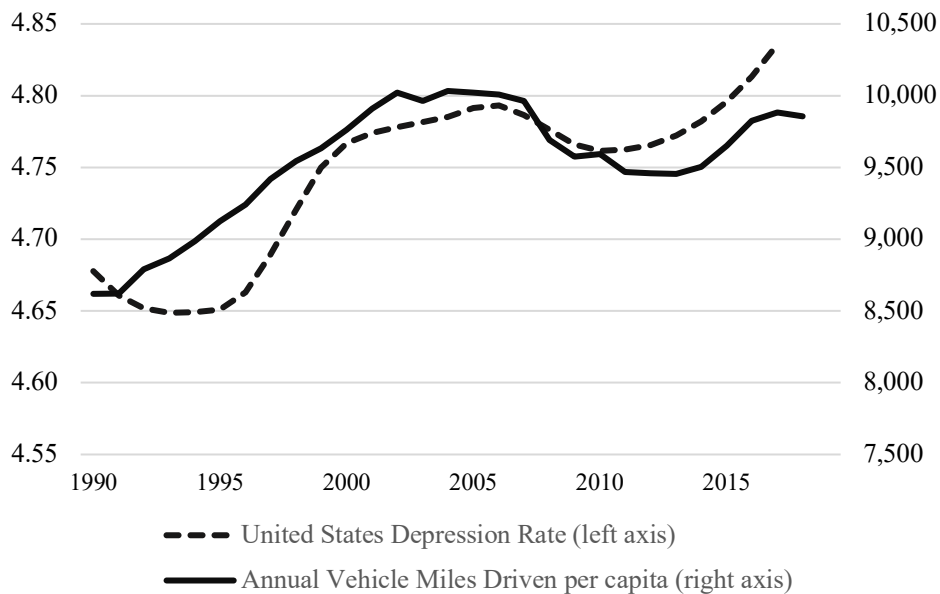
**Methodology for Measuring Quality of Relationships.** Direct and comparable measures of the quality of relationships over time are not available based on lack of information. I will use secondary proxies in order to supplement the sparse research on trends in the quality of relationships over time. By secondary proxies, I mean I will use existing predictors and correlates of relationship quality and measure changes in those indicators. Not all proxy indicators are easily measurable. For example, low self-control is related to low friendship quality (Boman, Krohn, Gibson, & Stogner, 2012). However, measuring self-control shares similar problems as measuring relationship quality. Another study discovered a link between romantic couples co-participating in a novel and arousing activity of going through an obstacle course rather than rolling a ball would increase relationship quality (Aron, Norman, Aron, McKenna, & Heyman, 2000). Again, the percentage and frequency of couples engaging in novel and arousing activities is difficult to measure over time. However, there are other proxy measures that have either been better recorded over time by reliable sources, or studied longitudinally. These include: vehicle miles driven, the rise of social media and technology, stress, obesity, sleep, and drug use. While the proxy method will not be a direct measure of relationship quality, the sum across multiple indicators will provide greater insight into directional trends in relationship quality.

***Vehicle miles driven.*** I will begin with the relatively straightforward example of vehicle reliance. There is a link between vehicle usage and neighborhood social capital. Leyden (2003) noted individuals living in a walkable, mixed-use neighborhood have higher levels of social capital compared to those living in car-reliant suburbs. Respondents in walkable neighborhoods were more likely to know their neighbors, participate politically, trust others, and be socially engaged. Freeman (2001) found a similar link. In studying the effect of residential density and

neighborhood ties, Freeman found neighborhood density and demographics were unrelated to the formation of social ties. Instead, the degree in which residents relied on their cars heavily impacted social ties as measured by comfort discussing important matters with a neighbor. In fact, an increase of just one percent in the proportion of individuals who drive to work was associated with a 73% decrease in the likelihood of having a neighborhood close social tie and a 71% decrease in the likelihood the respondent would have relatively more neighborhood ties.

Using vehicle reliance and use as a proxy indicator for closeness of neighborhood social ties shows a drastic increase in vehicle dependency. In 1960, 62.7% of Americans used a private vehicle to get to work (Koohi, 2013). By 2011, that figure increased to 84.4%. Those using public transportation, biking to work, walking to work, and working from home all declined over the same time period. Figure 1 below shows the highly correlated annual patterns of depression rates and vehicle miles per capita ( $r=.87$ ) in the United States.

FIGURE 1. Depression Rate and Vehicle Miles Per Capita



Note: Institute for Health Metrics and Evaluation. *Global burden of disease study 2017*. Retrieved from ourworldindata.org; United States Department of Transportation. *Highway Statistics Series*.

Total vehicle miles per capita and depression rates in the United States are highly correlated, and increasing in the last three decades. Vehicle reliance is a known correlate of the strength of neighborhood ties. Together, vehicle miles serve as a proxy for the deterioration of the quality of neighborhood social ties over the years.

***Social media and technology.*** A second proxy for relationship quality is well covered by researchers: the rise of social media use and technology. It is frequently touted as a direct contributor to the rise of depression rates among adolescent girls (Twenge, 2017). A 2014 field experiment, researchers found face-to-face conversations occurring in the absence of a mobile device were rated significantly superior and with higher levels of empathy than those with the presence of a cell phone (Misra, Cheng, Genevie, & Yuan, 2016). This is a concerning finding given that Drago (2015) found 97% of interviewed college students always brought their cell phone or tablet with them every time they left the house and 18% said they always use a cell phone or tablet when in the presence of friends and family. In further observations of students in a dining hall, 73% of those sitting with others spent their time texting or using computers and tablets (Drago, 2015). These findings were not limited to just teenagers as the primary technological user. Turkle (2017) found children were often the ones complaining that parents using technology neglected having face-to-face interaction with their kids. A meta-analysis completed by Cummings, Butler, and Kraut (2002) found computer-mediated communication was less valuable for building and sustaining close social relationships than face-to-face or telephone conversations. This is concerning, because Brignal and Van Valey (2005) found the pervasive use of the internet in education, communication, and entertainment has decreased the amount of face-to-face interactions students have. They further suggest the decline in face-to-face interactions may have significant consequences on the development of social skills. These

studies paint a stark picture for the effect of technology and social media on the quality of social relationships.

It is important to note many researchers have found positive interactions between social media, technology, and social capital. For example, Parks and Floyd (1996) found online relationships can be deep, meaningful, and participants can depend on each other more deeply. Another study found while greater consumption of social media content led to lower social capital and increased loneliness, directed communication had the opposite effect (Burke, Marlow, & Lento, 2010). Directed communication encompassed site interactions between a user and a friend in which one directly identifies the other, such as a wall post, direct message, or tagging a photograph. Increased directed communication led to greater bonding capital and decreased loneliness. Another controlled study found participants engaging in five chat sessions with an anonymous partner decreased loneliness and increased in perceived social support (Shaw & Gant, 2004).

Clearly, many studies show the negative impact technology has on the quality of social relationships. When combined with evidence of the positive impact of technology, it is likely technology and social media are neutral tools, but are currently being used in a manner that does harm the quality of social relationships and depression rates. This is concerning, because of a steady and rapid rise in internet use across all ages. In 1995, the Pew Research Center found only 14% of American adults had internet access (Fox & Rainie, 2014). This increased to 81% in 2014. Even more concerning, a Nielsen survey found the average American adult spent nine hours, 32 minutes interacting with internet media daily in 2014 (Fottrell, 2018). This rose to over 11 hours per day in 2018 (Fottrell, 2018). Between 2005 and 2015, social media use increased from 7% of American adults to 65%, with near-ubiquitous use among those ages 18-29

(Perrin, 2015). Similarly among adolescents, the percentage of twelfth graders who spend ten or more hours a week online rose from around 21% in 2006 up to almost 45% in 2015 (Twenge, 2017). Furthermore, among tenth graders, those spending more time on social networking sites, internet news, and streaming television were at greater risk of loneliness (Twenge, 2017). While the internet and social media is likely a neutral tool, current usage and impact trends indicate greater use is indicative of deteriorating relationship quality.

**Religion.** Being religious is associated with greater life satisfaction, but is mediated almost entirely by attendance and congregational friendship as measured by close friends within the same religious group (Lim & Putnam, 2010). These social interactions lead religious Americans to become better, more conscientious neighbors that donate more time and money, belong in more civic organizations, and get more involved with their community (Putnam & Campbell, 2010). Similarly, Diener, Tay, and Myers (2011) found life satisfaction benefits from being religious is mediated by social support, feeling respected, and having meaning in life. However, they found the difficulty of life as measured by indicators such as widespread hunger and low life expectancy directly impacted religious effects. Religion was associated with greater social support in countries with difficult life conditions, while countries doing well saw similar levels of subjective-well-being among religious and non-religious individuals. This differs from Wolfinger and Wilcox's (2008) finding that religious participation by fathers (regardless of marital status) was consistently associated with better relationships among new parents. The difference may be explained by variations in income. One study of 433 low-income marriages found shared religious beliefs about God's plan, praying together, and attending religious services together was associated with higher marital quality (Lichter & Carmalt, 2009).

These findings indicate religiosity is only a weak predictor of the quality of relationships,



and is more likely to have an impact among low-income couples. According to an analysis of the General Social Survey, the percentage of all American adults with no religious affiliation, never attended services, never pray, do not believe in God, and were not religious at all, increased between 1972 and 2014, with 1991 marking the beginning of a steep incline (Twenge, Sherman, Exline, & Grubbs, 2016). The percentage of individuals who stated they were not spiritual at all declined only slightly between 1998 and 2014, and only for those above age 30. This trend towards less religious views and attendance to religious services was even more dramatic among 18 to 29 year olds.

In summary, religion does not seem to be a strong indication social relationships are improving or deteriorating in quality across the United States. However, there has been a dramatic decrease in religious American beliefs and attendance in events, especially among the youth. It is likely in times of crises, such as a significant economic recession, Americans will have fewer close religious relationships to call upon for social support.

**Health.** There are a few health indicators that can also be used as predictors of relationship quality, though these tend to be bidirectional in causality. I will discuss the link between relationship quality and stress, obesity, sleep, and substance abuse.

**Stress.** Stress refers to any uncomfortable emotional experience marked by associated physical, mental, and emotional responses (Baum, 1990). It is often caused by problematic or demanding situations perceived to be stressful. Certainly, relationship quality does impact stress levels. The American Psychological Association (2015) reported adults receiving emotional support reported lower stress levels than those who did not receive emotional support. However, researchers have also found increased stress causes lower relationship quality. Stress is a threat to marital satisfaction and longevity, causing deterioration of relationship satisfaction and quality

(Randall & Bodenmann, 2009). Even stress caused outside of the marriage causes lowered relationship satisfaction and sexual activity within the couple (Bodenmann, Ledermann, & Bradbury, 2007). The impact on sexual activity is of importance because having sex once a week is associated with greater happiness, especially for those in romantic relationships (Muise, Schimmack, & Impett, 2016).

So, is stress on the rise in America? Probably. A dive into historical national surveys conducted on the Perceived Stress Scale showed stress increased from 12.07 to 15.52 among men between 1983 and 2009 and from 13.68 to 16.14 for women (Cohen & Janicki-Deverts, 2012). Increases in stress levels were observed by all age groups other than those over 65 years of age. This contrasts with the American Psychological Association's (2018) annual Stress in America survey, which has shown a steady decline in stress levels between 2007 and 2012, although levels remained relatively stable from 2012 to 2018. However, stress among millennials (born between 1981 and 1996) increased over the same time period. The Gallup Global Emotions Report found stress is increasing (Ray, 2019). Survey respondents reported a steady increase in experiencing stress from 46% to 55% of participants between 2006 and 2018. Furthermore, the Gallup report found Americans to be among the most stressed in the world, with 45% worrying a lot, and younger generations feeling greater stress. Overall, the evidence is inconsistent in terms of pointing towards increased stress levels over the years. What is significant and consistent is that stress levels are higher for women and higher for young generations. This coincides with depression rates rising more starkly for adolescent women and may point to increased stress as an indicator (albeit weak) for decreased relationship quality.

*Obesity.* Another health proxy for decreased relationship quality is obesity. American society views obese people as physically unattractive and undesirable (Puhl & Brownell, 2001).

Despite rising unconscious bias awareness, obesity remains one of the social stigmas still considered acceptable (Carr & Friedman, 2006; Puhl & Brownell, 2001). Severely obese individuals report higher levels of strain and lower levels of support in their family relationships, though these findings were contingent upon body weight at age 21 (Carr & Friedman, 2006). The researchers concluded obesity is a powerful predictor of quality of family relationships, even after controlling for demographics, health, and socioeconomic status. In another study of over 90,000 adolescent teenagers, overweight adolescents were found to be more likely to be socially isolated and be peripheral to social networks (Strauss & Pollack, 2003). While overweight adolescents listed similar quantity of friendships as non-overweight teenagers, the overweight adolescents were less likely to be listed and more likely to have zero friend nominations (Strauss & Pollack, 2003).

The evidence pointing towards negative interactions between obesity and quality of social relationships is concerning, especially because obesity has been on the rise in the United States since 1980 (United States Department of Health and Human Services, 2017). Among adults, obesity has increased significantly among both men and women between 1980 and 2000. More recently, between 2005 and 2014, obesity and extreme obesity increased significantly among women but not in men. Between 2011 and 2017, the prevalence of obesity increased 8.6% for adult males and 10.7% for adult females (Centers for Disease Control and Prevention [CDC], 2018). A similar and significant rise in the prevalence of obesity was observed in all groups age two to nineteen between 1980 and 2004. Since then, children between two to five years old have decreased in obesity, but the remaining age groups have experienced modest increases in obesity rates (United States Department of Health and Human Services, 2017). Among adolescents in grades nine through twelve, there has been an 8.7% increase in obesity

rates for males and a 23.5% increase for females across the same time period. Extending the time period from 2001 to 2017 shows a 23.2% increase in adolescent male obesity rates and an astounding 75.4% in females (CDC, 2019). Using rising obesity as a proxy measure for relationship quality indicates social ties may be deteriorating in the United States.

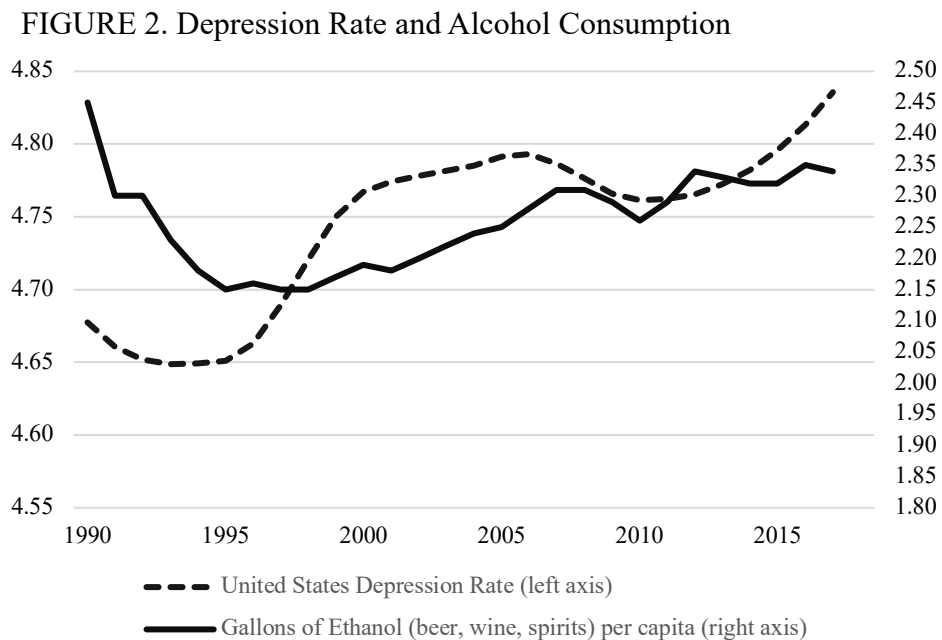
*Sleep.* Yet another proxy health indicator for the quality of social relationships is sleep. Ailshire and Burgard (2012) found troubled sleep was associated with having strained family relationships, while supportive family relationships are associated with less troubled sleep. Another study found lack of sleep and sleep disruptions had a negative association with relationship quality, though the direction of causality was not determined (Troxel, Robles, Hall, & Buysse, 2007). Outside of family relationships, researchers also found sleep deprivation increased the tendency to blame others for problems and reduced an individual's willingness to diffuse a situation by accepting blame (Kahn-Green, Lipizzi, Conrad, Kamimori, & Killgore, 2006). The researchers concluded sleep deprivation weakened the desire to behave in ways that facilitate effective, high quality social interactions.

This is concerning since the CDC noted an average of 7.9 hours of sleep each night for American adults in 1942, which decreased to 6.8 hours per night in a 2013 Gallup poll ("Sleepless," 2019). In a review of over 324,000 adults in the National health Interview Survey for 1985, 1990, and 2004-2012, researchers found mean sleep duration has decreased since 1985, and the percentage of adults receiving short sleep (defined as less than six hours) increased by 31% (Ford, Cunningham, & Croft, 2015). A replication of this study extended the time period by five more years also found yet another increased trend toward short sleep from 2013 to the end of the study period in 2017 (Sheehan, Frochen, Walsemann, & Ailshare, 2018). Again, the trend towards less sleep is consistent as well among adolescents. A review of teens who get less

than seven hours of sleep on most nights rose from around 26% in 1991 up to well over 40% in 2015 (Twenge, 2017; Keyes, Maslowsky, Hamilton, & Schulenberg, 2015). A larger review of trends from 1905 to 2008 also found decreases in sleep for children aged five to eighteen years in the United States (Matricciani, Olds, & Petkov, 2012). Using sleep as a proxy indicator shows the quality of social relationships is likely deteriorating.

*Alcohol and drug use.* A final proxy health measure for the quality of relationships is alcohol and drug use. Alcoholism, or alcohol addiction, is related to low quality in marital interactions, though evidence is more mixed for lighter alcohol use (Haber & Jacob, 1997). A study of 634 participants recruited at the time of applying for their marriage license found discrepant alcohol consumption within marriages predicted decreased marital satisfaction over time (Homish & Leonard, 2007). Caces, Harford, Williams, and Hanna (1999) found an increase of just one liter of alcohol per capita brings about an increase in the divorce rate of about 20%, though increased divorce rates also led to higher levels of drinking. However, the association between alcohol use and relationship quality is controversial. A meta-analysis of sixty studies showed alcoholism was maladaptive and associated with marital dissatisfaction (Marshall, 2003). However, the same meta-analysis found within a subset of studies, light drinking patterns were associated with adaptive marital functioning. Yet another study found consuming alcohol was good for the social interaction of women with low social self-esteem and had no effect on women with high social self-esteem (Monahan & Lannutti, 2000). Similarly, a 2014 study of Australians found light alcohol consumption to be an effective social lubricant that enhances social engagement (Dare, Wilkinson, Allsop, Waters, & McHale, 2014). While the effect of light alcohol use on relationship quality is not well established, it is clear heavy alcohol use is associated with poorer social relationships.

An analysis of over 79,000 American participants from the National Epidemiologic Survey on Alcohol and Related Conditions found high-risk drinking and DSM-IV alcohol use disorder increased substantially between 2001 and 2013 (Grant et al., 2017). High-risk drinking increased 29.9%, while DSM-IV alcohol use disorder increased by 49.4%. Overall alcohol consumption has been on the rise since 1995, as Figure 2 shows. In this case, the correlation between depression rate and gallons of alcohol per capita is only moderate at  $r=0.31$ .



*Note:* Institute for Health Metrics and Evaluation. *Global burden of disease study 2017*. Retrieved from ourworldindata.org; National Institute on Alcohol Abuse and Alcoholism. *Surveillance Report #113*.

Among adolescents, there has been a drop in the percentage of eighth, tenth, and twelfth graders who have ever tried alcohol or have recently binged alcohol since the 1980s (Twenge, 2017). Unfortunately, these same kids catch up once they arrive at college, with no changes observed in binge drinking (Twenge, 2017).

The story with drug use, especially opioids, is even more pronounced. Less lethal drugs like marijuana are still linked with lower relationship quality. One study found marijuana use

among adolescents predicted less relationship cohesion and harmony, with greater relationship conflict (Brook, Pahl, & Cohen, 2008). Another two studies found marijuana use decreased verbal interactions and increased feelings of sedation (Higgins & Stitzer, 1986; Foltin & Fischman, 1988). The effects of more lethal drugs like opioids is greater on relationship quality. According to the Substance Abuse and Mental Health Services Administration (2004), substance abuse can lead to parental deficiencies. Additionally, the administration notes substance abuse can damage relationships between generations and individuals. Abusers and their connections may experience abandonment, anxiety, fear, anger, embarrassment, and guilt. Abusers are likely to find themselves increasingly isolated from social connection. Reilly (1992) notes parents or children abusing drugs are likely to have negativism, parental inconsistency, and anger that undermines the quality of relationships.

Over the last few decades, Americans have increased drug use. In one review of marijuana use based on two national surveys conducted in 2001-2002 and 2012-2013, researchers found past-year prevalence use of marijuana increased from 4.1% to 9.5% (Hasin et al., 2015), with significant increases across all demographic subgroups. However, surveys in Monitoring the Future have shown after an initial increase in the percentage of twelfth graders who have ever tried marijuana in the 1990s, use has decreased slightly and remained relatively stable since 2000 (Twenge, 2017). Since 2008, there has been a sharp increase in the proportion of twelfth graders who believe occasional marijuana use is not risky, suggesting there may be a potential increase in use ahead of us as more states adopt the legalization of marijuana (Twenge, 2017). According to the CDC (2019), there has been an epidemic of opioid overdose deaths in the United States, with a six-fold increase between 1999 and 2017. The first wave of opioid overdose deaths began with prescription opioids in the 1990s, the second wave began in 2010

with the increased use of heroin, and the third wave began in 2013 with synthetic opioids (particularly those involving fentanyl). Currently, 130 Americans die on average daily from opioid overdose (CDC, 2019). Overall, there has been an increase in American alcohol and drug use, indicating there may be a deterioration of relationship quality.

**Indicators Relationship Quality May be Improving.** There are some alternate proxies that indicate relationship quality may be improving, though they tend to be weak. For example, economic hardship is correlated with poor marital quality (Conger et al., 1990). While income per capita is increasing in the United States, the poverty rate has remained largely stagnant with some cyclical trends since 1981 (Edwards, 2018). Another example is the decline in divorce rates since 1979 (Cohen, 2017). While divorce is declining, there has been a 50-fold increase in the number of marriage and family therapists, and this is expected to grow much faster than the average at 23% between 2016 and 2026 (American Association for Marriage and Family Therapy, 2019; United States Department of Labor, 2019). It is unclear whether marital counseling is on the rise due to deteriorating quality of relationships or if increased participation in such therapy has led to greater relationship quality.

A final example is increased parent-child time since 1965 may be improving relationship quality with parents (Dotti Sani & Treas, 2016). This was true across all educational levels and across mothers and fathers in the United States. However, Twenge (2017) bemoans the increase of helicopter parenting, in which parents pay excessively close attention to their children's experiences and problems. Helicopter parenting is associated with low self-efficacy, alienation from peers, and lack of trust among peers (van Ingen et al., 2015). So it is possible parent-child relationships have increased somewhat in quality, but at the cost of peer relationship quality. In summary, the proxy indicators for relationship quality improving do not indicate trends strong



enough to counteract indications relationship quality is deteriorating.

**Summary of Quality of Relationships.** Vehicle reliance, social media and technology, religiosity, stress, obesity, sleep, alcohol, and drug use all significantly or modestly affect relationship quality. Trends among these proxy measures point towards a likely deterioration in the quality of relationships in the United States. Even more, these proxies are likely to interact with each other, potentially with greater overall effect. For example, high levels of stress has detrimental health effects that may contribute to obesity, disturbed sleep, and drug use (Dallman et al., 2003; Åkerstedt et al., 2012; Sinha, 2008). While there are some proxy indicators that may suggest relationship quality is improving, the evidence is controversial and related trends are weak. Taken together, the proxy measures indicate the quality of relationships in the United States is likely deteriorating.

### **Discussion of Implications and Next Steps**

In this paper, I suggest the rise in depression rates is due to a deterioration of social relationships. Furthermore, I posit the deterioration is caused by a confluence of changes and behaviors prevalent in today's society. The literature review shows the quantity of close relationships is declining, while the proxy measurement method points toward a likely deterioration in relationship quality. While I have not provided a direct measure of the weight of love, the evidence reviewed presents a compelling case worth further investigation. There are a couple next steps to strengthen our understanding of changes in social relationships.

First, a meta-analysis of existing studies of relationship quality is in order. There are many studies that have measured relationship quality since the 1970s. Although the studies use various measures, some of which are mentioned in this review, they often use similar underlying themes such as intimacy, trust, and subjective relationship satisfaction. Analyzing the latent

correlation between scales in the meta-analysis will yield fruitful insights into historical trends of relationship quality. To the best of my research, this has not yet been done.

Second, social media offers an enticing data set researchers have begun tapping into over the past decade. Famously, Eichstaedt and colleagues (2015) found tone and sentiment of Twitter messages were better able to predict count-level heart disease mortality than even the combination of existing predictors like income, education, smoking, diabetes, obesity, race, gender, and marital status. A subset of this work indicated the presence of love, hate, and interpersonal tension. Over time, researchers can use social media correspondence to map changes in relationships. Gilbert and Karahalios (2009) were able to develop a model of distinguishing between strong and weak social ties on social media with over 85% accuracy. Participants rated the strength of their Facebook friendships, which were then linked to 74 potential predictors of tie strength. These variables included number of friends, educational differences, social network distance, length of time since first and last communication, the quantity of public and private messages exchanged, use of intimacy words like ‘family’, ‘friends’, ‘home’, ‘sexual’, swear words, ‘work’, ‘leisure’, ‘money’, ‘body’, ‘religion’, and ‘health’. Additionally, emotional support variables were created based on use of positive emotion words like ‘birthday’, ‘congrats’, and ‘sweetheart’, versus use of negative emotion words like ‘dump’, ‘hate’, and ‘useless’. Such analyses have amazing potential for gathering direct sentiment on various topics, including the strength of social relationships. This methodology does offer some potential problems—for example, the rise and fall of various platforms, or changes in user behaviors and interactions due to external factors or cultural shifts. Nonetheless, the rise of eternal documentation holds great promise for researchers.

I implore researchers to adopt these and other next steps in order to advance our

understanding of the state of social relationships in the United States. As mentioned earlier, close relationships are often described as the most important and meaningful areas of life. A greater understanding of whether modern culture is undermining these relationships can unlock happier, more fulfilling lives for ourselves and future generations. Just as important, understanding the mechanisms driving the decline in social relationships can help us counteract it intelligently. Rather than giving back many of the objective gains we have made since 1800, we should look at ways we can re-strengthen social relationships while maintaining or continuing to advance other measures.

For example, it does not make sense for us to stop all social media use. Technology and social media provide us with unprecedented levels of access to reach individuals and change culture. Korda and Itani (2013) outline several lessons for leveraging social media for health promotion. These include the ability to personalize health recommendations based on user preferences and characteristics, encouraging healthy behaviors such as exercise and meditation using social influencers and digital incentives, and increasing accountability and impact through improved metrics. Using this same idea, we can apply proven positive interventions that improve interpersonal well-being into best practices for social media. For example, performing acts of kindness on others is known to be one of the most reliable momentary increases in well-being among tested positive intervention (Seligman, 2011). Creating an “acts of kindness” social media campaign may not only increase temporary acts of love, but may also strengthen existing relationships.

Yet another example is creating more moments of connection. High-quality connections are short-term, positive dyadic interactions which enhance resonance between the individuals (Stephens, Heaphy, & Dutton, 2011). The researchers suggest respectful behaviors, task-

enabling, and play all serve as mechanisms that can increase high-quality connections in the workplace. Providing training on quality interactions, helping others complete or perform a task, and increasing play for adolescents and adults are all methods to strengthen social relationships moving forward. There are many other examples in which we can maintain the benefits of modernity while tending our social bonds. However, all of these potential gains rest on a greater understanding of changes in our social relationships. This paper is a step in that direction, but many more must be taken to ensure we advance well-being and mental health as much as we have made progress in living standards and longevity.

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