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Journal
American Psychologist, 75(4)

ISSN
0003-066X

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Publication Date
2020

DOI
10.1037/amp0000597

Peer reviewed

Published in final edited form as:

Am Psychol. 2020 ; 75(4): 511–524. doi:10.1037/amp0000597.

Charting Adulthood Development through (Historically Changing) Daily Stress Processes

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Abstract

This paper views adult development through the lens of daily-life experiences and recent historical changes in these experiences. In particular, it examines whether theories that postulate general linear increases in well-being throughout adulthood still hold during times of less prosperity and more uncertainty. Descriptive analyses of the National Study of Daily Experiences (NSDE) chart how stress in the daily lives of Americans may have changed from the 1990s (N = 1,499) to the 2010s (N = 782). Results revealed that adults in the 2010s reported experiencing stressors on 2% more days than in the 1990s, which translates to an additional week of stressors across a year. Participants in the 2010s also reported that stressors were more severe, posed more risks to future plans and finances, and that they experienced more distress. These historical changes were particularly pronounced among middle-aged adults (e.g., proportion of stressor days increased by 19% and perceived risks to finances and to future plans rose by 61% and 52%, respectively). As a consequence, age-related linear increases in well-being observed from young adulthood to midlife in the 1990s were no longer observed in the 2010s. If further studies continue to replicate our findings, traditional theories of adult well-being that were developed and empirically tested during times of relative economic prosperity may need to be reevaluated in light of the changes in middle-adulthood currently observed in this historic period.

Keywords

Daily Stress; Adult Development; Historic Change; Strength and Vulnerability Integration (SAVI) model

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An argument with a friend, a problem at work, or an unplanned home repair are all examples of common stressors, or hassles, of daily life. These experiences are often relatively transient and seemingly minor, yet they exert both short- and long-term effects on our well-being (e.g, Almeida et al., 2011). Researchers study how physical and mental well-being are shaped by both the daily stressors we experience -- including the type, frequency and severity of the stressors encountered -- as well as our reactions to them (e.g., Almeida et al., 2011; Geronimus et al., 2006; Thoits, 2010). In addition, researchers find that the stress process varies across the life span (Almeida et al., 2011). Overall frequency and severity of stressors decrease with age (Aldwin, Jeong, Igarashi, & Spiro, 2014; Stawski et al., 2008). In addition, older age is often related to less negative stressor appraisals (e.g., Neubauer, Smyth, & Sliwinski, 2018). Moreover, a recent coordinated analysis across seven daily stress studies indicates consistent age-related differences in stressor reactivity (i.e., stress-related negative affect; Stawski et al., 2019).

A number of findings from studies examining both the stress process as well as reports of positive and negative affect converge to indicate that older age confers benefits to well-being. Life-span developmental theories have described these well-documented age-related increases in well-being in terms of changes in time perspective (Aldwin & Igarashi, 2016; Carstensen & Charles, 2010), or changes in how people adapt to gains and losses that occur along the life span (Baltes & Baltes, 1990; Heckhausen et al., 2019). Yet, findings from several studies comparing the health and well-being of people assessed in the late 1990s to same-aged adults ten and fifteen years later have made people question whether this linear pattern still exists, and, if not, whether we need to re-think life-span development in this new era (e.g., Goldman, Glei, & Weinstein, 2018). The daily stress process provides an important context within which to examine age differences in well-being. The current paper reviews life-span development theories of well-being and then tests whether these predictions are consistent with cross-sectional research collected both in the late 1990s and in the 2010s.

The Case for Studying Daily Stress Processes across the Life Span

Development is often marked by the achievement of milestones and developmental tasks (Havighurst, 1972). Researchers often examine childhood development by the timing of skill acquisition or physical and cognitive development. In adulthood, milestones have traditionally been major life events that signal entry into a new life stage, such as work status, marriage, parenthood, and retirement. The life event tradition focuses on discrete, observable, and objectively reportable life changes that are relatively infrequent (e.g., marriage, divorce or job loss) and require significant adjustment on the part of the individual (e.g., Dohrenwend, 2006). As such, life events often have been used as markers of social development that also shape adult health and well-being (see review by Almeida, Piazza, Stawski, & Klein, 2011).

Another approach to development is the study of how daily life changes across adulthood not through major milestones, but by the accumulation of day-to-day experiences. A growing number of researchers agree that studying stress processes through this microscopic and dynamic approach, and particularly the effects of the accumulation of daily stressors, offers an important window into understanding adult development and health (Almeida et

al., 2011). Daily stressors are minor rather than major events and arise out of day-to-day living, such as work-related problems and caring for others, or unexpected occurrences that disrupt daily life, such as spousal arguments and malfunctioning computers. Life events and daily stressors are correlated, but they have independent effects on health outcomes (Aldwin, Jeong, Igarashi, Choun & Spiro, 2014). Moreover, because people are confronted with a myriad of such stressors day-in and day-out (i.e., quotidian stressors), their effects aggregate over time to exert an equal if not greater impact on individual well-being than do major, but very infrequent life events (Aldwin et al., 2014).

How to Capture Daily Stress

Our understanding of daily stressors has benefited tremendously from the development of daily sampling methods, such as daily diaries or experience sampling techniques, that include repeated measurements from individuals during their daily lives. For example, daily diary studies use short questionnaires or telephone interviews, where individuals report on the stressors they experienced on that day, as well as their behaviors, physical symptoms, and emotional states during that same time frame. Diary methods have a number of virtues (see review by Bolger, Davis, & Rafaeli, 2003). For example, obtaining information about individuals' actual daily stressors over short-term intervals circumvents concerns about ecological validity that constrain laboratory-based findings. Furthermore, diary methods alleviate retrospective memory distortions that can occur in more traditional questionnaire and interview methods that require respondents to recall experiences over longer time frames.

Perhaps most importantly, daily diary designs permit the assessment of daily stress processes that distinguish stressor exposure (i.e., the likelihood that an individual will experience daily stressors), stressor severity (i.e., the appraised or expert-rated stressfulness of daily stressors), and stressor reactivity (i.e., the emotions or physical symptoms on stressor days, Bolger & Zuckerman, 1995). These daily stress processes exert immediate effects on emotional and physical functioning (for reviews, see Almeida 2005; Zautra, 2003), and these effects can amplify vulnerability to long-term problems such as anxiety, depression, and chronic health conditions (Charles, Piazza, Mogle, Sliwinski, & Almeida, 2013; Piazza, Charles Sliwinski, Mogle, & Almeida, 2012). How individuals appraise daily stressors may be more reflective of life-span developmental processes than simple exposure (Charles, 2010). Further, a daily diary approach allows for within-person assessments of coping strategies, which often provide a markedly different picture than analyses examining between-person assessments (for a review, see Aldwin, Lee, Choun, & Kang, 2019). In other words, comparing coping in a particular episode to the individual's average use of a specific strategy often provides a more sensitive indicator of its association with health outcomes than simply comparing across individuals.

An impressive body of knowledge demonstrates that the effects of these daily thoughts, emotions, stress processes, and behaviors accumulate over time to create developmental pathways that have both short- and long-term predictive effects for a variety of key outcomes in the domains of physical health and emotional well-being years later (Aldwin, 2007). For example, daily stressors are related to dysregulated diurnal cortisol (Stawski et al., 2013),

decreases in energy metabolism and increase in fat oxidation (Kiecolt-Glaser et al., 2015), impairments in blood vessel functioning (Greaney, Koffer, Saunders, Almeida, & Alexander, 2019), and decreased heart-rate variability (Sin, Sloan, McKinley, & Almeida, 2017), all of which are risk factors for the development of cardiovascular disease. Longitudinal data from the National Study of Daily Experiences (NSDE) indicate that people who reported greater stressor reactivity at baseline were 46 percent more likely to experience affective disorders and 33 percent more likely to have increased chronic health conditions 10 years later (Charles et al, 2013, Piazza et al., 2012). They also were more likely to have decreases in composite indicators biological health increases (i.e. allostatic load; Piazza, Stawski, & Sheffler, 2018). Finally, findings from two separate studies have shown that exacerbated reactivity to daily stress predicted elevated mortality risk (Chiang, Turiano, Mroczek, & Miller 2017; Mroczek et al., 2015).

Explanations for Age-Related Patterns of Daily Stress

Despite the common assumptions that late life is a time of increased stress and decreased well-being, research has consistently shown that the number of both life events (Aldwin et al., 2011) and daily stressors (Almeida et al., 2011; Stawski et al., 2019) decline with age, presumably due to a decrease in social role participation (e.g., work and active parenting roles), as well as changes in stress appraisal and coping processes (Aldwin & Igarashi, 2016; Charles & Luong, 2013). Thus, it is not surprising that several studies have shown increases in positive affect with age (Carstensen et al., 2011; Stone et al., 2010), and age-related increases in life satisfaction that peak around age 65 (Mroczek & Spiro, 2005).

By and large, older adults experience fewer daily stressors, and perceive the ones they do experience as less threatening (Almeida et al., 2011). These findings reveal a relatively positive outlook for older individuals as they age. As a result, researchers have turned to existing theories of life-span development to explain how people experience and respond to stressors across adulthood. These theories often described age-related changes as the result of shifts in selecting or prioritizing certain goals across the course of one's life (e.g., Carstensen, Isaacowitz, & Charles, 1999; see also Heckhausen, Wrosch, & Schulz, 2019). For example, the model of selective optimization with compensation and theories of motivation and control have described how adults shift their motivational goal striving as a response to age-related losses (Baltes & Baltes, 1990; Heckhausen et al., 2019). Socioemotional selectivity theory describes shifting priorities as a function of how much time people perceived they have left to live (e.g., Carstensen et al., 1999). As people grow older and perceive their time left in life as growing shorter, they increasingly prioritize emotional goals. Motivational strivings for emotional fulfillment and deriving emotional meaning increase, which often results in high levels of emotional well-being (Carstensen et al., 1999). As a result of this shift in time perspective, older adults, compared to their younger counterparts, appraise stressors more benignly and focus their attention to more positive aspects of their environment. The positivity effect, which was developed from socioemotional selectivity theory, describes how, across the adult life-span, adults increasingly shift their attention and memory to more positive aspects of their environment (Reed, Chan, & Mikels, 2014).

Strength and Vulnerability Integration (SAVI) is a theoretical model that also predicts changes in emotional well-being across the adult life span (Charles, 2010; Charles & Luong, 2013). SAVI posits that as people age, they become more adept at using thoughts and behaviors that reduce their exposure to situations that elicit distress. Older adults are less likely to appraise situations as stressors (Aldwin & Igarashi, 2016). When they do, they appraise them less negativity (Luong & Charles, 2014) and remember them more positively (Reed et al., 2014). These strategies are the strengths of aging, gained as the result of time perspective from time left to live and from time lived. As people perceive their time left in life growing shorter, they increasingly emphasize emotion goals (as posited by socioemotional selectivity theory, described above). As a result, older adults are motivated to avoid daily stressors, and to perceive the negative situations they cannot avoid more benignly.

Changes in time perspective motivate older adults to avoid situations that will elicit distress, but time lived provides them with greater self-awareness and knowledge about themselves and their environment to aid in emotion regulation efforts (Aldwin & Igarashi, 2016; Blanchard-Fields, 2007). In addition, time lived provides older adults with experience that helps them to identify situations that are best avoided; determine whether a problem is, in fact, a stressor; use emotion regulation strategies that have worked well in the past; and be aware of limitations that may preclude certain actions.

Time perspective and time lived provide strengths of aging. Yet, SAVI also acknowledges age-related vulnerabilities that make regulating high levels of physiological arousal more difficult. As people age, their physiological system becomes less able to adapt to perturbations in the system. Age-related changes to physiological systems have been compared to the effects of chronic stress, associated with greater activity in some systems and less activity in others (e.g, Prenderville et al., 2015). These age-related changes make mounting a defense in response to the physiological effects of a stressor more difficult. Compounding these age-related changes is the increasing prevalence of chronic illnesses across adulthood. An estimated 81% of adults over 65 have two of more chronic health conditions (Buttorf, Ruder, & Bauman, 2017). These conditions further make people more vulnerable to high levels of distress (von Kanel, 2015).

Older adults have both strengths and weaknesses that influence how they respond to stress, a paradox that partially explains why age-related findings can be remarkably inconsistent (e.g., Kunzman, 2008), and why, for example, studies often observe increases in negative affect after age 65 (Griffen, Mroczek, & Spiro, 2005). SAVI posits that researchers can predict which older adults will be successful at regulating their emotions, and in which circumstances. When people are in situations where they can use their strengths of aging – those emotion regulation strategies that allow them to circumvent or quickly disentangle themselves from a potentially stressful event -- they will do so often more successfully than younger adults. Long after the event has passed, they will remember these experiences more positively and less negatively, as predicted by the positivity effect (Reed et al., 2014).

When placed in a situations where older adults have little control to avoid stressors that elicit high levels of distress, however, this distress will be difficult to regulate or sustain given age-

associated physiological vulnerabilities. As a result, linear decreases in distress with age will not be as apparent under these circumstances, and may even disappear or at times even reverse in direction. By integrating knowledge about life circumstances into our understanding of age-related strengths and vulnerabilities, we can predict when older age will be related to higher levels of well-being, and when this pattern will not be observed.

Reconsidering Age-related Patterns of Daily Stress

Towards the end of the twentieth century, many studies primarily focused on normative age-graded influences on well-being that occur at certain ages across the life span (Baltes, Cornelius, & Nesselroade, 1979). Participants in these studies were fairly well-educated, middle-class and white, and they lived in democratic countries in times of relative economic prosperity. Most studies focused on self-reported well-being, and those that examined external stressors often included subgroups of older adults in specific challenging life circumstances, such as older caregivers or those who recently experienced widowhood.

Yet, age-graded influences comprise just one category of developmental influences. According to life-span developmental theory, human development is also shaped by history-graded influences and non-normative influences (Baltes et al., 1979). History-graded influences refer to more global sociocultural events that define an era, and non-normative events refer to idiosyncratic events that are not common to many people, and are not tied to any developmental or historical period (Bronfenbrenner, 1986; Elder, 1974; Schaie, 1965).

Our interest in examining potential recent history-graded influences that could modify the nature of aging was spurred by a paper focused not on emotional well-being, but on mortality (Case & Deaton, 2015). This paper reported that, for the first time in recent history, white middle-aged Americans were no longer outliving the previous generation, a finding largely driven by less educated adults. Although the paper focused on physical health, the authors speculated that economic and psychosocial factors were largely responsible. They labeled the causes of death (suicide, poisoning, and liver damage) as “deaths of despair” and searched for concomitant psychological data to bolster their speculation of increasing distress in this population segment. When comparing reports of 40–54-year-olds from 1997–1999 to same-aged individuals who responded in 2011–2013, they found that adults in the later-born cohort reported greater pain, worse self-rated health, higher rates of serious mental illness, and greater alcohol use than their earlier-born peers. The authors speculated that even though this trend was evident as early as 1998, the Great Economic Recession of 2008 had contributed to, or magnified, this effect.

Another study considered potential social and psychological factors that may contribute to “deaths of despair.” Goldman, Glei, and Weinstein (2018) examined psychological well-being among two different historic cohorts ranging from 24–76 years old, one cohort sampled from 1995–1996 and the other from 2011–2014 in the Midlife in the United States study (MIDUS). They found that people lowest in socioeconomic status (SES) from the 2010s cohort were less happy, experienced more negative emotions, and were less satisfied with their life compared to their same-aged counterparts from the 1990s cohort. Among people of higher SES, participants in the 2010s cohort were no different if not slightly less

distressed than their counterparts from the 1990s. Thus, age-related patterns of stress can be affected by historic period and other sociocultural factors.

Not Prosperous Times, Not Prosperous People

The idea that historical circumstances impact the everyday lives of different cohorts in unique ways is deeply rooted in life-span psychological and life course sociological theories. The basic idea is that cohorts differ from one another in their life patterns in often profound ways because they develop under different societal conditions (Elder, 1975). Despite this long and rich tradition, these conceptual perspectives have rarely been tested empirically. Our objective here is to move in this direction, and we have identified a minimum of three sets of reasons why the dynamics of everyday life could be more challenging and stressful nowadays than in the past. First, as a consequence of the Great Economic Recession of 2008 and the resulting economic turmoil, people lost their jobs, had difficulties finding adequately paid new jobs, and had fewer economic resources to deal with and to master daily challenges (Manstead, 2018). To illustrate, working multiple jobs, not being able to pay off loans, and being at risk of unemployment on a daily basis conjointly create a breeding ground for more frequent and more severe daily stress, particularly for socioeconomically disadvantaged groups (Kirsch et al., 2019).

A second line of reasoning concerns psychological costs that are often associated with societal trends of modernization and individualization (Allan, 2008; Beck, 1992). As has been argued repeatedly, life today is less socially rooted, more fluid, and less societally structured than in the past. People are more alienated from their communities and have less confidence in and more distrust of society (Pharr, Putnam, & Dalton, 2000; Twenge et al., 2004). Social connections that people once relied on to master their daily-life challenges may have weakened. For example, having neighbors may not guarantee even a minimum receipt of instrumental help when needed as people have had in the past (Putnam, 2001). As a consequence, the social roles people hold and the socio-emotional net people are drawing from have changed over the past decades. Together, these changes may lead to people perceiving their life as being less predictable, more uncertain, more socially disconnected, and less controllable than in the past (for discussion, see Putnam, 2001; Twenge, Zhang, & Im, 2004), which in turn increases levels of daily stress.

A third line of reasoning revolves around historical changes in the pace of life and probably also in the perception of time. Current lives may be more hectic and fast-paced, leaving little time for relaxation and recovery after having mastered major challenges. In a similar vein, the fast pace of innovation and (technological) advancements result in acquired bodies of knowledge, insights, and skills quickly becoming obsolete and irrelevant – and people may know this and may be concerned about falling through the cracks (Levine & Norenzayan, 1999; Misra, & Stokols, 2012). As a consequence, we may expect that later-born cohorts are experiencing their daily lives as more stressful than same-aged earlier-born cohorts. We also expect that a larger percentage of people in later-born cohorts are perceiving time as going by more quickly, and such perceptions of time contribute to historical changes in stress processes as well.

Thus far, empirical studies of the role of historical change for adult development and aging have either targeted differences in mean-levels of functioning at a given age, or differences in trajectories of stability and change across macro-time scales such as years and decades (for overview, see Drewelies, Huxhold, & Gerstorf, 2019). Moving one important step further, we present data that are the first to examine how the stressful aspects of adult *daily* lives have changed historically, and whether such trends are similar in young, middle-aged, and older adults. We expected that the presumed historical increases in stress perceptions and reactivity are particularly pronounced among those in young and middle adulthood, but less so in old age. This expectation was based on the larger literature on cohort differences in adult development and aging according to which historical change among older adults (but not necessarily middle-aged and younger adults) is by and large a success story, with older adults today often acting younger and feeling younger than those in earlier generations (for overview, see Gerstorf, Hülür, Drewelies, Willis, Schaie, & Ram, 2019). This expectation was also consistent with the life-stage principle (Elder, 1974) according to which the impact of historical changes on individual characteristics depends on the age and the part of the life span a given person is in. It is in this sense that we expected younger and middle-aged adults to be more affected by economic conditions (e.g., decreasing job security), faster adaptation to technological advances and the increasing pace of communication (e.g., digitalization), and changes in family structure (e.g., greater diversity of family types). Following the findings from Case and Deaton (2015) and Goldman et al. (2018) noted above, we also expected that low-SES strata are particularly vulnerable to historical increases in stress perceptions and reactivity.

Midlife in the United States: National Study of Daily Experiences

We provide evidence for historical shifts in daily stress and well-being by using data from the National Study of Daily Experiences (NSDE), one of the satellite studies of the Midlife in the United States Survey (MIDUS; for a description see Almeida, McGonagle & King, 2009). To compare trends across historical time, we examined data from the initial wave of the NSDE, which includes a national sample of 1,499 adults (696 men, 803 women), aged 25–74, randomly selected from the larger MIDUS in 1995–1996 (i.e., the 1990s data collection) In 2010, new participants were added to the MIDUS parent project including a national sample of 782 adults (347 men, 435 women) to the NSDE in 2012–2014 (i.e., the 2010s data collection). Both samples were primarily White (91% in the 1990s, 85% in the 2010s). Given the specific recruitment design, both samples included 42% midlife adults. The age groups were pre-selected based on the age periods we wanted to capture conceptually. Younger adults were defined as those between 25 and 44, middle age was 45–64, and older adulthood was 65 to 75. Both samples were also fairly educated, with 51% and 54% of respondents having some college or completed a college degree.

NSDE participants responded to daily telephone interviews across 8 consecutive days. On average, respondents completed 7 of the 8 interviews in the 1995–1996 wave ($SD = 1.43$) and 7.5 of the 8 interviews in the 2012–2014 wave ($SD = 1.41$) showing good compliance with the daily diary protocol. Respondents were asked to report on experiences they had in the last 24 hours (or since the last interview). Each interview included a section on daily stressful experiences: arguments, avoided arguments, home/work overloads, network events

that occurred to a close friend or relative, and other experiences identified as stressful but not fitting into the noted categories. For each event reported, respondents indicated its severity level and the risk they felt that event posed to their finances and their future (rated 0–3). Additionally, respondents rated their negative mood that day on a series of six items (feeling restless, nervous, worthless, so sad nothing could cheer up, everything was an effort, hopeless). Responses could range from 0 to 4, and in our analyses, we summed them to capture negative affect for that day.

From this information, we are able to extract a number of indicators about daily stressful events including the average number of days during which individuals experience these events; average ratings of severity and risk; and levels of negative affect on days with and without a stressful event. The consistency in protocol across the two waves of data collection across 18 years or so allows us to directly compare these indicators of stressful experiences among similarly aged adults. This puts us in a position to gain a perspective on how these experiences are changing across historical periods for different subgroups of individuals.

We first provide descriptive statistics for the stressor characteristics across the two historic periods. Stressor characteristic include percent of stressor days (at least one reported stressor), severity of stressors, perceived financial and future risk appraisals, and negative affect on days with (i.e., stressor reactivity) and without stressors. We next display these characteristics across periods by age group (young adults: 25–44, midlife adults: 45–64, older adults: 65–75) and then by levels of education (high school degree or less, some college to a college degree, graduate schooling). We tested differences across historical periods using multilevel modeling (MLM), which allows us to examine differences in daily experiences when days are nested within persons nested in historic period, while accounting for the fact that some people are missing some days of data. All models included a random intercept to allow for individual differences in daily outcomes. For models examining age and education differences in historical period, we examined specific contrasts testing period differences. These models included age group and education (coded as indicated above) and adjusted for sex, race/ethnicity, and marital status. We capture historical change in these characteristics as a percent change by taking the difference between the 2010s and the 1990s and dividing by the value in the 1990s.

Overall, our analyses show a fairly clear picture of daily life being more stressful in recent times compared to the past. Table 1 shows average levels of daily stress and well-being during the 1990s (early period) and during the 2010s (later period) as well as results from the MLM analyses testing the significance between each stressor characteristic across the two historical periods. On every indicator but one, respondents reported significantly more daily stress and lower well-being in the 2010s compared to the 1990s. Perceived stressor severity trended in the expected direction of higher levels in the 2010s, with p=.051. For example, in 2010s, respondents reported stressors on 2% more days, which translates to an additional week of stressors. Even more striking is the difference in stressor appraisal. The extent that daily stressors are perceived as posing risk to finances and to future plans rose from the 1990s to the 2010s by 27% and 17%, respectively. These appraisals are reflected in reports of greater negative affect in the 2010s.

In general, daily life appears to be more stressful in recent times compared to the 1990s. We were also interested in whether certain age groups were more vulnerable to this trend. Figure 1 shows levels of daily stress and well-being for younger (ages 25–44) middle-aged (ages 46–64) and older (ages 65–75) adults. The age pattern of daily life stress differed by historical period. The earlier historical period exhibited a clear linear pattern across age groups, with older adults reporting lower levels of stress and better well-being, followed by middle aged adults, and then younger adults. In contrast, by the 2010s, this pattern had shifted. Middle-aged adults' indicators of daily stress equaled or exceeded their younger counterparts. In the 2010s, the midlife adults appeared as the most stressed age group. On every indicator of daily stress and well-being, midlife adults demonstrated significant upticks between the 1990s and the 2010s, whereas older adults showed some evidence of historical increases in well-being. Particularly remarkable was that midlife adults' proportion of stressor days increased by 19% (b = .28, SE = .09, t = 3.16, p = .002), and their stressor-related risks to finances and future plans rose between 1995 and 2012 by 61% (b = .13, SE = .04, t = 3.12, p = .002) and 52% (b = .17, SE = .05, t = 3.69, p < .001) respectively. Finally, overall levels of negative affect increased on both stress-free days and stress days by 50% (b = .39, SE = .13, t = 3.04, p =.002) and 40% (b = .55, SE = .18, t = 3.03, p = .003), respectively. Whereas other age groups showed historical decreases in stressor-related negative affect, the midlife group showed significant increases.

Midlife adults in the 2010s are experiencing more daily stress than their age peers in the 1990s, but are there disparities within this age group? Figure 2 shows education differences in daily stress and well-being among the midlife adults at both historical periods. On average, more educated midlife adults reported more daily stressors than less educated midlife adults; however, those with less than a graduate education reported upticks in stressor days between the 1990s and the 2010s, a difference significant only for individuals who reported some college or a college degree (b = .33, SE = .12, t = 2.69, p = .007). Midlife adults with some graduate education reported significantly greater stressor-related risks to their finances in the 2010s compared to those in the 1990s (b = .31, SE = .11, t = 2.82, p = .005). Stressor-related financial risk among well-educated midlife adults increased by 65% between the 1990s and the 2010s. On average, midlife adults reported greater stressor-related risks to future plans between the 1990s and the 2010s, and this increase was significant for high school or less (b = .21, SE = .10, t = 2.23, p = .026) and the some college to a college degree groups (b = .14, SE = .07, t = 2.27, p = .023). Daily negative emotions also showed dramatic change from the 1990s and the 2010 for midlife adults in the lower education groups. In particular, midlife adults with high school or less education experienced an 86% increase in daily negative affect on stress-free days (b = .55, SE = .26, t = 2.10, p = .036) and 41% on stressor days (b = .69, SE = .28, t = 2.47, p = .014). Thus, these figures paint a differentiated picture of the changing landscape of daily life for middle-aged adults with high education and for those with less education: For those with the highest levels of education, daily life in more modern times brings more risks to finances, whereas for those who are less educated, daily life brings more negative emotions.

Summary and Future Directions

Summary

In the 1990s, people were not fully interconnected by the web, smart phones were non-existent, and the U.S. economy was expanding. Since then, the world has witnessed a global recession, political upheaval, and the rise of a technologically more advanced, and arguably faster paced, world. We examined how stress in the daily lives of Americans may have changed across this time period, comparing the daily lives of adults in the 1990s to similarly aged adults in the 2010s. Generally, adults in the 2010s reported experiencing a greater number of daily stressors, and – as a group – they reported these stressors as being more severe and posing a greater risk to their finances and to their future compared to the reports of same-aged adults in the 1990s. They also report higher levels of daily distress than did their same-aged peers in the 1990s. Overall, life has gotten more stressful. The study found that this was particularly true for middle-aged adults.

Age patterns of adult daily stress in the twenty-first century.—Results indicate that in the 1990s the number of daily stressors were less frequent among each successively older age group, and negative affect exhibited a linear pattern of cross-sectional decline with age. In contrast, this age-related linear pattern of reductions with age was no longer apparent in the 2010s. For lifespan developmental psychologists, these findings call into question the historical generalizability of theories that were formulated based on findings from the second half of the twentieth century. Participants in psychological studies of aging had often experienced the benefits of social security coupled with pensions, retirement savings, and a growing economy. The current findings, however, portray a different age-related pattern, and one that changed as a result of historical shifts in the reports of middle-aged adults. In the 2010s, middle-aged adults perceived their stressors as equally severe as younger adults, and they appraised them as more threatening. Middle-aged adults also reported higher daily levels of negative affect, on both days with stressors and days without stressors, than did younger adults. We acknowledge that with the current design, it is not possible to disentangle period effects from cohort effects. For example, if period effects were operating, then the detrimental effects of the economic recession of 2008 may be reduced or nullified in the decade to come, provided that the larger economic situation improves. In contrast, the differences seen among middle-aged adults in the 1990s vs. the 2010s may have emerged already when these groups were children or young adults because of some formative, stress-inducing experiences (e.g., the later-born cohort was in adolescence and young adulthood during the heydays of the Cold War in the early to mid-1980s). If such cohort effects were operating, then the challenges observed here for middle-aged adults were to foreshadow how these people function as older adults over the next few decades.

Future Directions

SAVI emphasizes the importance of understanding life circumstances when predicting age-related trajectories of well-being (Charles & Luong, 2013). The theoretical model focuses on age-graded differences, but posits that circumstances of later life that reduce feelings of control and expose people to highly negative stressors can alter the usual observed patterns of age-related increases in well-being. The current findings suggest that historically

changing life circumstance influence emotions, but the middle-aged adults, not the older adults, were most affected. We speculate that the circumstances influencing this large, national sample emanate from global events, including the economic downturn and the advent of technology. Economic downturns, and the need for workers to learn new skills or face obsolescence as a result of disruptive technologies, are events that presumably influence people in midlife more so than younger adults and people near or at the end of their careers. Moreover, people in midlife are sometimes referred to as the "sandwich generation," a term that refers to their responsibilities for both their children as well as aging parents. For them, economic uncertainty not only threatens their own lifestyle but also the lives of the people for whom they feel responsible. Our results bolster this idea by showing that middle-aged adults reported the highest levels of concern about stressors undermining their finances and their futures. This is in line with the life-stage principle (Elder, 1974) in that historical changes may result in large cohort differences in one particular phase of life (e.g., middle aged adults), but probably not in other phases of life (e.g., older adults).

Focusing on midlife. Midlife is considered a pivotal phase in the life course, with middle-aged adults in many respects playing a central and instrumental role for the success and development of other people in the family, workplace, community, and society at large (Infurna, Gerstorf, & Lachman, 2019). To illustrate, middle-aged adults typically have families that rely on them for financial security. For example, middle-aged adults are often involved in college processes and co-signing of loans, which in turn increases their financial risks and is one of the key factors why people aged 45 and older have the fastest growing rate of bankruptcy (Thorne et al., 2018). Consistent with this larger pattern is our finding that financial concerns were highest for the well-educated. This may reflect the increasing burden of student loan debt. A recent report from the National Center for Educational Statistics estimated that 80% of the student loan debt associated with graduate studies (NCES, 2013). We may be witnessing this burden in the daily stress of well-educated midlife adults. Another possibility is that people with higher education may have more assets than do people with less education attainment. For this reason, well-educated midlife adults may worry more about risks to their financial gains, whereas lower-educated people may instead have higher levels of overall distress (i.e., negative affect) as a result of their lack of assets.

It is unclear if and how much of the historical effects observed were driven by historical changes that lie in the eye of the beholder (e.g., people of today may be more sensitive to identifying and reporting stress). Such possibility, however, can neither be ruled out nor is it of prime relevance because stress is by its very definition a subjective concept, in which subjective appraisals and perceptions are of key importance for the physiological, behavioral, and psychological stress reactivity people exhibit.

Focusing on technology. With the advances in technology and data analytics, future research will be able to go well beyond capturing individual's reports of daily life to using GPS, passive sensors of physiology and behavior as well as data from the multiple screens that we interact with on a daily basis to better determine who, when and under what circumstances are individuals experiencing stress. In addition to using technology to capture stressful events, we can assess how historical changes in communication, technology, and mobility

may provide both benefits and risks to well-being. As a possible upside, the zone of exploration and self-regulation that people are comfortable navigating in may be extended because people have better and more easily access to (online) resources that allow them to get back to their equilibrium (Reeves, Ram et al., 2019). As a possible downside, such extended resources may be outweighed by increases in stress because digital technologies make people available to others all the time and responses are expected immediately.

A focus on diversity and disparities.—The current findings suggest that we need to examine history-graded influences that may leave certain groups disproportionately advantaged or disadvantaged based on societal structure and change. For example, we expect that certain stress experiences today are particularly pronounced among women relative to men. Some exploratory analyses in the current data set showed that gender moderated the period effect for anticipated financial risk of stressors but not for stressor exposure, stressor severity and future risk from stressors. Women reported significantly greater financial risk in 2010 compared with women in 1995 ($p = .0002$) and this difference was not present for men ($p = .6452$). Gender disparities in education and labor force participation have been reduced tremendously over the past decades (Newton et al., 2014; Shockley & Shen, 2015). However, women still are responsible for more household responsibilities than men (Blair-Loy, Hochschild, Pugh, Williams, & Hartmann, 2015). Consequently, women in later born-cohorts are now often faced with double jeopardy of pursuing their own career and work advancement while remaining responsible for a greater share of the household-related chores and child care (Duffy, 2007). Future research should focus on this nexus of work-family demands and responsibilities (i.e., work-family conflict) as a major source of stress particularly for women.

As another example for why we should examine how different groups may show divergent developmental trajectories in well-being, recent studies indicate that age-related benefits in well-being observed in the later twentieth century are not universal: age-related increases in life satisfaction observed among heterosexual, gay, and lesbian adults are not observed among bisexuals (Wardecker, Matsick, Graham-England & Almeida, 2019). Moving forward, a more systematic inquiry using cohort-sequential studies of daily life stressors in later life are needed to understand the impact that the sociohistorical context has in late life. In addition, lifespan developmental patterns should be compared across different communities varying in socioeconomic status, and across countries varying on a number of socioeconomic and political indicators, and within other contexts that may reveal different patterns by age.

Cultures and societies around the world are becoming more diverse and polarized along many dimensions, including ethnicity, economic status, and politic stance. For example, in the US, economic disparities are widening, resulting in increasing differences in the lengths of lifespan and trajectories of well-being among different groups. Homelessness among older adults has increased dramatically in the past 25 years, with half of the homeless population now over the age of 50, as compared to 11% in 1990 (Brown et al., 2016). We need new ways of data collection that will better access the homeless and those in deep poverty, as well as those in rural America who may have only tenuous connection to the internet.

The mass migrations induced by climate change are just beginning and will only become worse in the next few decades, leading to both political instability and polarization, as well as possible economic opportunities, as migration may help support the costs of aging populations in most of the developed world. This increasing diversity will require a different stance on the part of psychologists, to engage in more field studies with much larger samples in order to adequately sample diverse population subgroups. This will also necessitate changes in the types of data analyses done, to focus not on mean level changes but to explore the plethora of pathways that aging and emotional well-being can take. We urgently need more cross-cohort and cross-period studies to understand the plasticity in the aging process, and not assume that what was true of the WWII cohort will be the case for later cohorts.

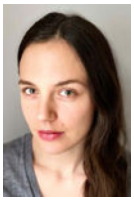
Conclusion

The relatively rosy picture of aging and emotional well-being derived from studies completed in the past century appears to still describe the stress process of the oldest adults, but not to age-related advantages for people in midlife anymore. For middle-aged adults instead, daily life is more stressful, and particularly so for people who are socioeconomically disadvantaged. As noted earlier, it is unclear whether the differences seen for middle-aged adults today will or will not continue in the future as these evolve into older and older ages. Advances in technology and changes in economic forces influence our daily experiences, and these experiences shape our well-being. Our findings suggest that the passage of historical time over recent decades has positively influenced the well-being of some groups more than others, creating differences that also lead us to re-evaluate and refine traditional models of emotions across the adult life span.

Acknowledgments

This work was supported by John D. and Catherine T. MacArthur Foundation Research Network and the National Institute on Aging (P01-AG020166, U19-AG051426, R01 AG019239).

Biography



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Public Significance Statement:

This study examined how stress in the daily lives of Americans may have changed across the past two decades. Generally, adults in the 2010s reported experiencing a greater number of daily stressors, and – as a group – they reported these stressors as being more severe and posing a greater risk to their finances and to their future compared to the reports of same-aged adults in the 1990s.

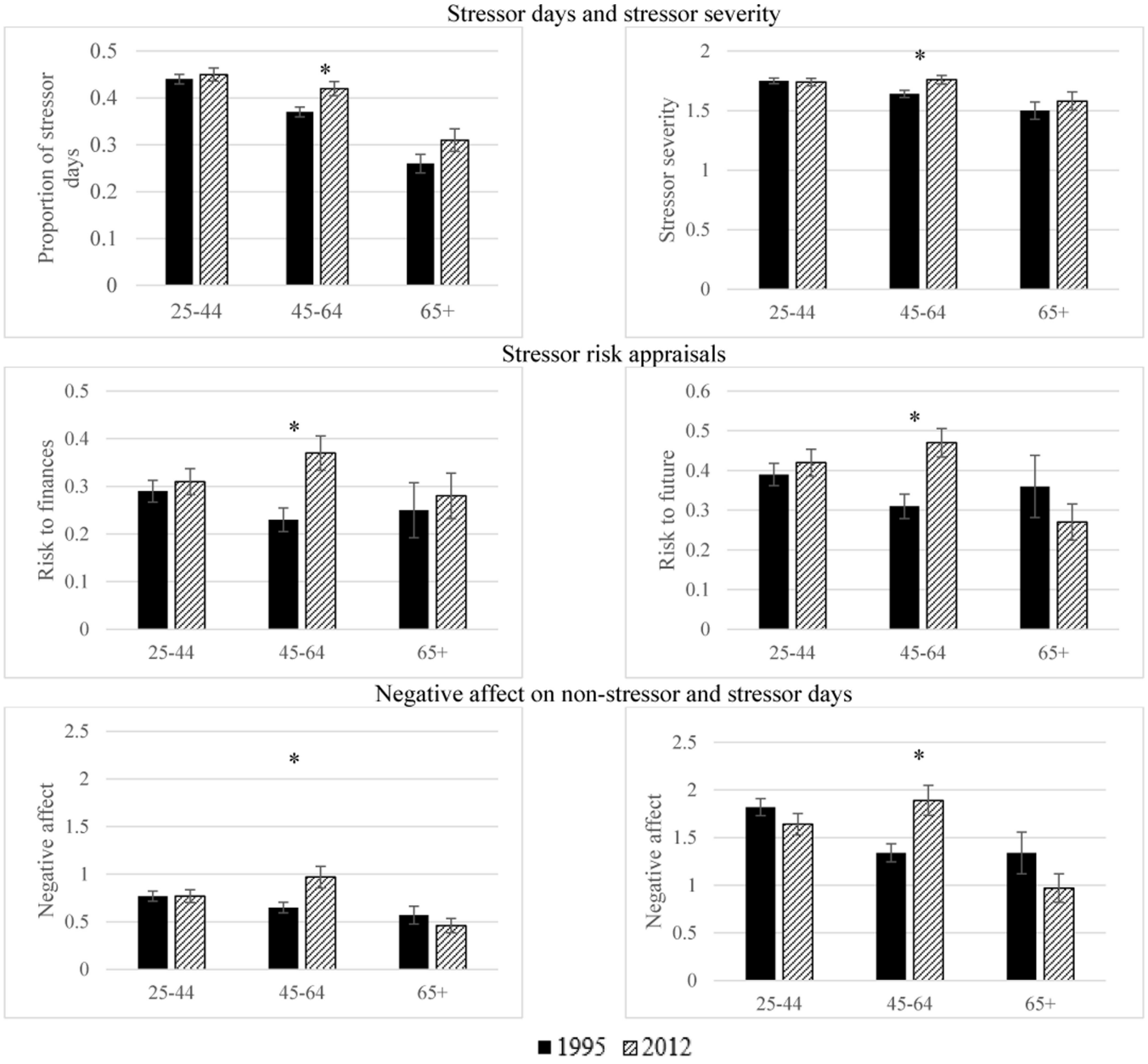

Figure 1 –.

Stressor characteristics for different age groups across periods (solid bars = 1995; dashed bars = 2012). Error bars represent standard errors. Significance tests calculated using multilevel models controlling for sex, race/ethnicity, and marital status. * $p < .05$.

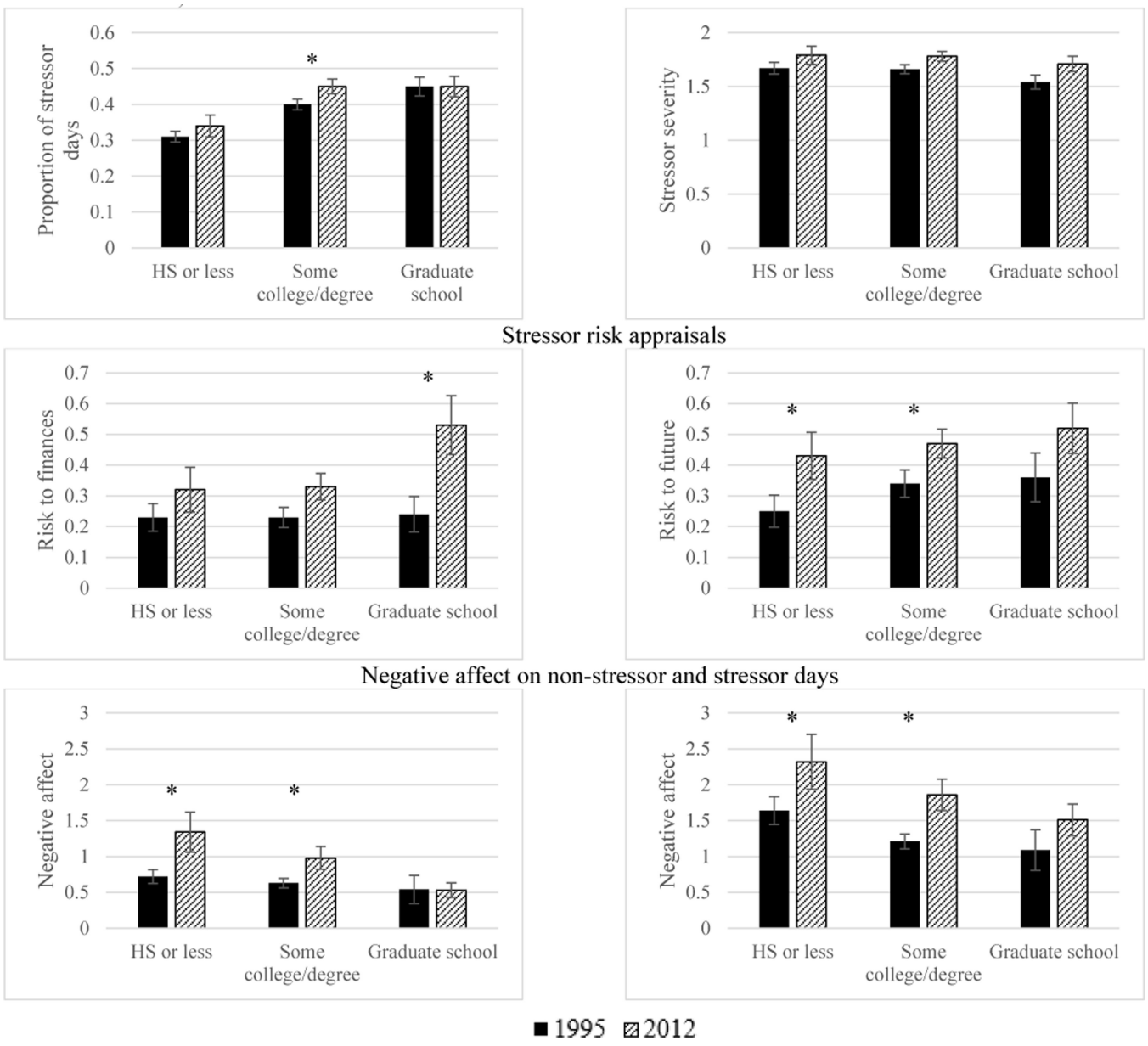

Figure 2 –.

Stressor characteristics for midlife individuals at different levels of education across periods ((solid bars = 1995; dashed bars = 2012)). Error bars represent standard errors. Significance tests calculated using multilevel models controlling for sex, race/ethnicity, and marital status. * $p < .05$.

Table 1

Descriptive statistics for stressor characteristics across historical period

		Proportion of stressor days		Stressor severity		Finances		Future		Non-stressor NA		Stressor NA	
	N	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
1995	1499	0.395	0.265	1.69	0.67	0.26	0.54	0.36	0.64	0.7	1.34	1.58	2.27
2012	782	0.421	0.269	1.73	0.61	0.33	0.55	0.42	0.6	0.81	1.56	1.66	2.31
Significance test		b = .11, SE = .06, t=1.96, p=.049		b = .05, SE = .03, t=1.95, p=.051		b = .07, SE = .03, t=2.48, p=.013		b = .09, SE = .03, t=2.76, p=.006		b = .20, SE = .07, t=2.46, p=.014		b = −.17, SE = .08, t=2.08, p=.037	

Note. *N* = Sample Size; *M* = mean; *SD* = standard deviation. The significance tests are from multilevel models accounting for nesting of days within persons, models adjusted for age group, education, sex, race/ethnicity, and marital status.