Published in final edited form as:
Psychol Aging. 2014 March ; 29(1): 57–71. doi:10.1037/a0035042.

Do Hassles and Uplifts Change with Age? Longitudinal Findings from the VA Normative Aging Study

Carolyn M. Aldwin,
Oregon State University

Yu-Jin Jeong,
Oregon State University

Heidi Igarashi, and
Oregon State University

Avron Spiro III
VA Boston Healthcare System and Boston University Schools of Public Health and Medicine

Abstract

To examine emotion regulation in later life, we contrasted the modified hedonic treadmill theory with developmental theories, using hassles and uplifts to assess emotion regulation in context. The sample was 1,315 men from the VA Normative Aging Study aged 53 to 85 years, who completed 3,894 observations between 1989 and 2004. We computed three scores for both hassles and uplifts: intensity (ratings reflecting appraisal processes), exposure (count), and summary (total) scores. Growth curves over age showed marked differences in trajectory patterns for intensity and exposure scores. Although exposure to hassles and uplifts decreased in later life, intensity scores increased. Growth based modelling showed individual differences in patterns of hassles and uplifts intensity and exposure, with relative stability in uplifts intensity, normative non-linear changes in hassles intensity, and complex patterns of individual differences in exposure for both hassles and uplifts. Analyses with the summary scores showed that emotion regulation in later life is a function of both developmental change and contextual exposure, with different patterns emerging for hassles and uplifts. Thus, support was found for both hedonic treadmill and developmental change theories, reflecting different aspects of emotion regulation in late life.

Keywords

stress appraisals; emotion regulation; aging; hedonic treadmill; affect

Hassles are the ordinary challenges of daily life (Almeida, 2005; Delongis, Folkman, & Lazarus, 1988). These daily stressors are relatively frequent, small events that cause tension

Correspondence should be addressed to: Carolyn M. Aldwin, Human Development & Family Sciences, School of Social & Behavioral Health Sciences, Oregon State University, 424 Waldo Hall, Corvallis, OR 97331. Carolyn.Aldwin@oregonstate.edu.
Carolyn M. Aldwin, Yu-Jin Jeong, & Heidi Igarashi are in the Program in Human Development & Family Sciences, School of Social and Behavioral Health Sciences, Oregon State University, while Avron Spiro III is at the VA Boston Healthcare System and Boston University Schools of Public Health and Medicine.
Dr. Jeong is currently at the Department of Child Studies, Chonbuk National University, Jeonju, South Korea.

NIH-PA Author Manuscript
NIH-PA Author Manuscript

or unexpected disruptions (Stawski, Sliwinski, Almeida, & Smyth, 2008). Taken individually, daily stressors can seem minor and insignificant; however, a growing body of literature suggests that these relatively minor stressors influence well-being through their accumulation over time (Almeida, Piazza, Stawski, & Klein, 2011; Zautra, 2003). Because of this linkage between health and the accumulation of exposure to daily stress, it is important to understand how exposure to hassles and their intensity changes over time and with age. The literature on whether aging affects hassles is rather equivocal, and results vary depending on whether exposure or the intensity of daily stressors is investigated. Further, most studies are cross-sectional or short-term longitudinal studies (e.g. less than one year), yet longer-term longitudinal studies are needed to determine whether hassles reflect developmental processes (Stawski et al., 2008).

Even less research exists on the influence of uplifts, or positive daily events, on health, although some recent studies have indicated the potential beneficial effects of positive events on well-being, including inflammatory markers (Jain, Mills, Von Känel, Hong, & Dimsdale, 2007), cortisol levels (Pluess et al., 2012), and positive affect (Charles et al., 2010). Thus, the role of uplifts may be important to physical health and well-being in later life (Folkman & Moskowitz, 2000; Maybery, Jones-Ellis, Neale, & Arentz, 2006). However, the literature on whether age affects the experience of uplifts is surprisingly scarce.

Examination of age-related change in hassles and uplifts offers an important opportunity to study aging and emotion-regulation in context. We explored patterns of change in both hassles and uplifts over a 16-year period in a sample of middle-aged and older men. We were particularly interested in whether there were individual differences in trajectories of hassles and uplifts and in whether the patterns of change in hassles and uplifts were similar or distinct, with the latter suggesting greater differentiation and complexity in emotion regulation.

Does Age Affect the Occurrence of Hassles and Uplifts?

Kanner, Coyne, Schaefer, and Lazarus (1981) found no age differences in hassles among the middle-aged but found that the older adults reported more uplifts. While hassles and uplifts scales have been used in older samples to predict health outcomes (e.g., Klumb & Baltes, 2004), we were unable to locate another study that examined age-related differences or change using this measure, although studies with an abbreviated measure found that men in late life are less likely to report hassles than middle-aged men (Aldwin, Sutton, Chiara, & Spiro, 1996; Boeninger, Shiraishi, Aldwin, & Spiro, 2009). Thus, to inform our theoretical model of emotion regulation in context, we reviewed daily diary studies for age differences in hassles or daily stressors. Given the dearth of studies on aging and uplifts, we drew from the literature on age-related change in positive and negative affect (Charles & Carstensen, 2007; Griffin, Mroczek, & Spiro, 2006; Mroczek & Kolarz, 1998).

Hassles: Intensity and exposure

Ratings of hassles severity or intensity tap appraisal processes that reflect not only an individual’s age but also their immediate context. The literature on age differences in appraisals of the intensity of hassles in daily diary studies is mixed. Some studies found that older adults perceived daily stressors to be less severe and disruptive compared to younger and middle-aged adults (Almeida & Horn, 2004), and interpersonal relationships as less irritating (Birditt, Fingerman, & Almeida, 2005). In contrast, Stawski et al. (2008) found that younger and older adults did not differ in their reports of stressor severity. This divergence in findings could be attributed to differences in how daily stress was measured, the health status of the older participants in the sample, or the use of in-person versus phone interviews (Stawski et al., 2008).

The pattern of exposure to or frequency of hassles during adulthood appears clear. Based on self-reports obtained in cross-sectional studies, older adults report fewer daily stressors when compared to younger adults (Almeida & Horn, 2004; Charles et al., 2010). Stawski et al. (2008) found that younger adults (mean age = 20 years), compared with older adults (mean age 80 years), reported more hassles. Older adults reported fewer daily stressors in a late-life sample (Charles et al., 2010), especially those related to interpersonal tensions (Birditt et al., 2005).

Various reasons have been proposed for this decline in exposure to hassles with age. Some have suggested that the ability and motivation to avoid negative situations increase with age, or that health limitations constrain activities and reduce exposure to stressful situations (Stawski et al., 2008). Life course factors, such as the acquisition and relinquishment of roles, might influence both the level of and the types of hassles reported. For example, Aldwin et al. (1996) found that older men were less likely to report work and child-related hassles, but were more likely to report health hassles.

Uplifts: Intensity and exposure

Little is known about how exposure to uplifts changes across the lifespan and even less is known about the perceived intensity of positive experiences. In a study of daily uplifts in women 63 – 93 years old, age was associated with fewer uplifts (Charles et al., 2010). Together with the Kanner et al. (1981) study cited earlier, this might suggest that uplifts are stable through midlife and decrease in later life. Relevant to this decline in uplifts, Charles et al. (2010) found a positive association between the occurrence of daily stressors and uplifts, which supports the idea that older adults might place themselves in fewer situations that could be stressful, yet in doing so also reduce their exposure uplifts as well. Limiting exposure to potentially uplifting situations might be detrimental because uplift exposure was related to gains in positive affect by women regardless of age (Charles et al., 2010). Furthermore, recent studies on the beneficial effects of uplifts on health biomarkers and positive affect (Folkman & Moskowitz, 2000; Maybery et al., 2006) suggest that greater attention should be given to understanding the role of uplifts and other positive processes across the lifespan in the context of emotion regulation.

Emotion Regulation and Aging

This complex and somewhat contradictory picture of changes in hassles and uplifts in adulthood may be more comprehensible if considered in the context of aging and emotional regulation theories. As Griffin et al. (2006) observed, there are two basic approaches to emotion regulation in adulthood. The first is stability (Costa & McCrae, 1980), or what

Brickman, Coates, and Janoff-Bulman (1978) termed the "hedonic treadmill." To the extent that emotion regulation is related to personality, and personality often reflects relatively stable processes, then affective processes, both positive and negative, should also be relatively stable. Early views of the hedonic treadmill argued that environmental events might temporarily alter affect levels, but people largely returned to baseline.

The premise of the hedonic treadmill contrasts with contextual and developmental approaches, both of which allow for the existence of change in emotion regulation with age. For example, Diener, Lucas, and Scollon (2006) argued for a more nuanced version of the hedonic treadmill theory, recognizing that the environmental context and stress can alter emotional "set points." Various aspects of well-being may have different set points and trajectories, and individual differences in how individuals adapt to stress may result in individual differences in stability and change in affect.

The second view argues for systematic developmental changes in emotion regulation with age (for reviews, see Aldwin, Skinner, Zimmer-Gebeck, & Taylor, 2011; Charles et al., 2010). Perhaps the best known of these is Carstensen's socioemotional selectivity theory (Carstensen, Mikels, & Mather, 2006) which posits that growing recognition of one's time limitation – whether due to aging or serious illness – can alter one's perspective such that there is a decrease in attention to negative events or themes and a re-focusing on positive ones. Thus, with age, there should be decreasing levels of negative affect and increasing – or at least stable – levels of positive affect. Consistent with this hypothesis, Carstensen et al. (2011) found that the stability of emotional experiences was greater with age.

Baltes and Smith (2003) argued that this might be true only for the young-old, but the "old-old," those in the "fourth age" of life, are challenged by serious declines in both mental and physical health and thus may show increases in negative affect and decreases in positive affect. Indeed, in a cross-sectional analysis of the Berlin Longitudinal Study on Aging, Smith, Fleeson, Geiselman, Settersten, and Kunzman (1999) found that this was particularly true of positive affect: those 85 and older reported much lower levels of PA than those between the ages of 74 and 84.

Charles (2010) recently applied socioemotional selectivity theory to the "stress and aging" conundrum: older adults are physiologically more vulnerable to stress and also appear more vulnerable in laboratory settings, but in field studies, they often appear less vulnerable than younger adults. She argued that this is because older adults have better emotion regulation skills, especially in interpersonal situations (Berg & Upchurch, 2007). Aldwin, Park, and Spiro (2007) came to a similar conclusion, but attributed this phenomenon more specifically to appraisal processes. They argued that the apparent better ability of older adults to maintain equanimity in the face of stress was derived from a greater perspective based on a long history of coping more or less successfully with stressors. Thus, older adults appear less likely to appraise situations as problems, and are more likely to use minimalist strategies that deflect or decrease negative arousal (see Aldwin, 2007). Boeninger et al. (2009) tested the appraisal part of this hypothesis and found that nearly all of the variance in older men's ratings of the stressfulness of problems was due to age differences in primary appraisal processes concerning the type of problem the hassle posed (e.g., harm, threat loss, challenge, threat to others, or annoyance). Older men reported fewer appraisals of particular events, suggesting that they may be more likely to keep problems from multiplying across domains (Pearlin, Mullan, Semple, & Skaff, 1990), thus decreasing stress. Further, the number of stressors reported on a particular day mediated the relationship between age and negative affect, highlighting the key role of hassles in the level of negative affect experienced (Birditt et al., 2006).

These different theoretical approaches to aging and emotion regulation make clearly different predictions about how (and whether) emotion regulation should change with age, with some arguing for stability, others for differential patterns of increase in positive and decrease in negative affect, and yet others for non-linear patterns. From a transactionalist or developmental systems viewpoint (Aldwin, 2007; Lazarus & Folkman, 1984; Lerner, 2006), however, changes in emotion regulation with age cannot be adequately examined without understanding the context in which these changes occur, which clearly can influence emotion regulation processes.

In Lazarus' theory (Lazarus & Folkman, 1984), the key to the stress and coping processes – one aspect of emotion regulation – lies in how individuals appraise a stressful situation. Appraisal reflects both person and contextual factors. Primary appraisal refers to the qualitative character of the stressor – whether it is a threat, harm, challenge, or benign – while secondary appraisal refers to the stressor severity. Stress results from a mismatch between an individual's coping resources and the environmental demands. The more the demands outpace the resources, the more stressful the situation. Appraisals, in turn, affect coping resources in a recursive manner – if the initial coping strategies are unsuccessful in resolving the problem or regulating the emotions, the problem is appraised as more stressful than it initially appeared and coping strategies and effort may be altered. Conversely, successful coping may result in a decrease in how stressful the situation is eventually rated. While emotion (and self) regulation is larger than just how individuals appraise and cope with stress (see Eisenberg & Zhou, 2001), appraisal processes may well prove key in understanding emotion regulation processes in stressful contexts (Aldwin, 2007).

Appraisal processes are generally applied to stressful situations, such as hassles. However, we argue here that appraisal processes are also germane to positive episodes such as uplifts. In other words, whether (and the extent to which) something is experienced as an uplift is also a function of both person and environmental characteristics. Folkman and Moskowitz's (2000) work on positive experiences in the context of caregiving for AIDS patients is a case in point. In this highly stressful context, small successes or pleasant interludes can be experienced very intensely. Similar findings have been reported for parents caregiving for disabled children (Tennen & Affleck, 2002).

Most studies of emotion regulation in late life focus on positive and negative affect; however, a handful of studies have found that the trajectories of both positive and negative affect are influenced by contextual factors (Carstensen et al., 2011; Griffin et al., 2006), and that positive emotional experience trajectories were influenced by personality and physical health. However, there were still significant random effects, perhaps reflecting the impact of contextual factors. Examining hassles and uplifts allows for a better understanding of emotion regulation in context. Furthermore, the existence of those random effects suggests that there may be individual differences in emotion regulation with age, which would warrant exploratory analyses examining different patterns of change with age over time.

Present Study

The purpose of this study was to examine how trajectories of hassles and uplifts changed over 16 years in a sample of middle-aged and older men. To our knowledge, the Veterans Affairs (VA) Normative Aging Study (NAS) is the only study which has longitudinal data on hassles and uplifts over an extended period of time, and thus we are uniquely situated to examine age-related changes in emotion regulation in the context of daily experiences. From a lifespan perspective, we are particularly interested in exploring different types of trajectories. We examined four questions.

1. *Do appraisals of hassles and uplifts intensity change with age?* We used ratings of hassles and uplifts intensity as an indicator of event appraisals, which is one aspect of emotion regulation. If the personality/hedonic treadmill approach is correct, then intensity ratings for both hassles and uplifts should be relatively stable. However, if the developmental approach is correct, there should be decreases in the intensity ratings for hassles and increases (or at least stability) in intensity ratings for uplifts, with a possible reversal of these trends in very late life (e.g., > 75). We also hypothesized that there would be individual differences in the trajectories of hassles and uplifts with age, which may reflect the various theories on change and stability in affect.

2. *Does exposure to hassles and uplifts change with age?* Given age-related normative changes, including loss of social roles, it is likely that there will be decreases in exposure to both hassles and uplifts, although very late life may show an increase in hassles as individuals face functional limitations which can make everyday activities more difficult. Again, we expect individual differences in patterns of changes in exposure to both hassles and uplifts with age.

3. *Do summary scores of hassles and uplifts change with age?* We explored whether the summary scores reflected patterns of primarily emotion regulation or of exposure, or some combination thereof.

4. *Do people generally show similar changes in hassles and uplifts?* We also explored the overlap in patterns of trajectories between hassles and uplifts. We expected that individuals might show similar trajectories of both hassles and uplifts (e.g., low stable in both or high variable in both), but, given Diener et al.'s (2006) caution that different aspects of well-being exhibit different trajectories, it is possible that patterns will be discrepant.

METHODS

Sample and Procedure

The VA Normative Aging Study (NAS) screened approximately six thousand men in the Boston area between 1961 and 1970 based primarily on their health status. The final sample consisted of 2,280 men aged 21 to 81 at enrolment, who were free of serious chronic illness and had blood pressures below 140/90. These men also had extensive family and social ties in the region and were likely to remain in the area. They had a higher socioeconomic status than the general Boston population: approximately 90% had a high school diploma. More than 91% of men were married. The sample reflected the racial profile of Boston in the late 1960s, primarily White (Spiro & Bossé, 2001).

NAS men complete periodic biomedical examinations, scheduled every three years since 1984. Starting in 1989, the Hassles and Uplifts Scale (Delongis et al., 1988) was completed on the day of the medical examination. For this study, we began with 1,389 men who were alive in 1989 and who completed questionnaires any time between1989 to 2004. Of these, 1,336 individuals (96%) completed the hassles and uplifts questionnaires at least once between1989 to 2004. The men were aged 48 to 101; however, given the small numbers under 53 or over 85, we excluded 104 observations from 89 men. (Some of these 89 men nonetheless had observations within the designated age range; only 21 men had all observations excluded). The final sample included 1,315 men with 3,894 observations (mean of 3.6 observations, SD = 1.3, range = 1–6). The mean age of the sample in 1989 was 63.31 (SD = 7.6).

Most (88%) of the men were married. More than half (52%) of them were retired, but 40% of those retired were still employed part-time. Only 9% of the sample did not complete high school, 25% of them had a high school degree, and the rest had at least some college education. The sample did not differ from the 74 omitted men on age, education, marital status, or employment status.

Measures

Demographics—Marital status and employment status were taken from a mail survey administered in 1988 (Bossé, Aldwin, Levenson, Spiro, & Mroczek, 1993), before the start of the hassles and uplifts assessment. As education was very stable in the NAS men, we used the variable from the Social Screening Survey (Rose & Bell, 1971) administered at study enrolment.

The *Hassles and Uplifts Scale (HUS;* DeLongis et al., 1988) includes 53 items that survey health, work, interpersonal, intrapersonal, and environmental stressors during the past week. Each stem item is rated twice, i.e., the extent it has been a hassle and/or an uplift, using a 4-point Likert scale (0 = *none or not applicable,* 1 = *somewhat,* 2 = *quite a bit*, and 3 = *a great deal.* For example, item #4, "Your family" could be both a slight hassle during the past week (e.g., rating = 1) and a major uplift (e.g., rating = 3). If something was neither a hassle nor an uplift that week, both scores would be 0. If we were only measuring hassles, this rating would be considered a stress severity score. Because uplifts were also rated, we prefer to use the term "intensity," as uplift "severity" seems a misnomer.

We computed three different types of scores for both hassles and uplifts. First, *intensity scores* were the averages of the ratings for the items which the respondents indicated they had experienced. The intensity scores ranged from 1 to 3 for both hassles (M=1.28, SD=.33) and uplifts (M=1.75, SD=.45). Second, *exposure scores* for both hassles and uplifts were counts indicating the number of items that the respondent had experienced. The ranges were 0 through 53. The mean (SD) of hassle and uplifts counts were 14.47 (SD=10.76) and 24.43 (SD=11.73), respectively. Following DeLongis et al. (1988), we also computed *summary scores* for hassles and uplifts by summing responses across the 53 items. The possible ranges of the summary scores were 0 to 159; the observed ranges were 0 to 140 for hassles (M=18.96, SD=15.90) and 0 to 158 for uplifts (M=43.40, SD=25.33).

Analyses

To investigate Questions 1, 2, and 3, we used two different types of longitudinal analyses. First, to examine normative and age-related changes as well as individual differences in the hassles and uplifts scores, we fit multilevel longitudinal models with linear and polynomial (e.g., quadratic) age terms. Next, to determine patterns of change of hassles and uplifts with age, we used group-based modelling (GBM; Jones, Nagin, & Roeder, 2001). For both types of analyses, the temporal axis was the 33-year age-span rather than the 16-year time-period.

We computed the trajectories of hassles and uplifts from the ages of 53 to 85 using multilevel longitudinal modeling (Hox, 2002) in *STATA 12* (StataCorp, 2011). We used the *xtmixed* command for intensity and summary scores (continuous variables) and *xtmepoisson* command for exposure scores (count variables) (Rabe-Hesketh & Skrondal, 2012). Hassles and uplifts scores can be considered as two-level data with occasions nested in individuals. Multilevel models handle missing data by using all available information (Hox, 2002), and do not assume an equal number of observations at each wave or equal spacing between waves.

Examining the observed mean scores by age revealed apparent non-linear trends (see Table 1). An earlier study on life events in this population also found non-linear effects (Aldwin et al., 2011). Thus, we tested a quadratic age term at each step. We tested the fixed effects, and then added random intercepts. Next, the random effect of age was added in the model, and then age-squared. Age was centered at 53.

$$Y_{ij}=\beta_0+(\beta_1+\zeta_{ij})\,(\text{centered age})+\beta_2(\text{centered age})^2+\zeta_{\text{j}}+\varepsilon_{ij} \quad \text{(EQ 1)}$$

In Equation 1, Y_{ij} refers to hassles or uplifts scores at age *i* within an individual *j*. β_0 represents the mean intercept, and ε_{ij} represents the residual at each age within person. The value of β_1 indicates the fixed change of hassles or uplifts scores per year, while β_2 refers to the fixed effect of non-linear effect per year. The ζ_{j} indicates a random intercept which allows individual differences in the initial level (intercept) across persons. The ζ_{ij} is the random effect of linear age slopes. (Preliminary analyses indicated no significant random effects for the quadratic age term, so this term was omitted.)

As we had a relatively wide age range at baseline (53–85 years), relative to the length of follow-up (16 years), we examined the extent to which our results from Equation (1) met the assumption of age convergence (Sliwinski, Hoffman, & Hofer, 2010). This assumption refers to the situation in which differences *between* individuals (i.e., cross-sectional age differences) and age-related changes *within* individuals (i.e. longitudinal age changes) converge onto the same developmental trajectory, and that within- and between-person estimates of changes align. In order to test the assumption of age convergence, we calculated the mixing weight that controls the ratio of the cross-sectional (β_b) and longitudinal (β_w) age slopes to the convergence (β_c) age slope (Sliwinski et al., 2010); see Equation (2).

$$\hat{\omega}=\frac{\hat{\beta}_{\mathrm{C}}-\hat{\beta}_{\mathrm{W}}}{\hat{\beta}_{\mathrm{B}}-\hat{\beta}_{\mathrm{W}}} \quad \text{(EQ 2)}$$

According to Sliwinski et al. (2010), when values of ω are less than 0.2, the age convergence slopes can be considered to reflect mainly within-person (age) effects, and when they exceed 0.8, they primarily reflect between-person (birth year) effects.

We examined Question #4 using a two-step process. First, the GBM analysis was used to identify patterns of change in summary hassles and uplifts. We then compared overlapping membership between classes of hassles and uplifts summary scores and used χ^2 to test for independence.

We identified different patterns or classes of trajectories using a group-based mixture approach that allows a mixture of probability distributions (Jones et al., 2001). The mixture models are used to identify subgroups in the population having different parameter values. The marginal density for an outcome *y* can be expressed in the following equation.

$$f(y)=\sum_{k=1}^{K}\Pr(C=k)\Pr(Y=y|C=k)=\sum_{k=1}^{K}p_k f(y,\lambda_k) \quad \text{(EQ 3)}$$

In this equation, C refers to a general class, k refers to a particular class; p_k is the probability of belonging to class *k* with corresponding parameter that can vary by time in longitudinal data.

The TRAJ procedure in SAS allows modeling in several ways. For the intensity and summary scores, the *CNORM* command was used because this model is appropriate for continuous data (Jones et al., 2001), where *j* is the group tested:

$$y^{*j}{}_{it}=\beta^{j}{}_{0}+\beta^{j}{}_{1}(\text{centered age})_{\mathrm{it}}+\beta^{j}{}_{2}(\text{centered age})^{2}{}_{it}+\varepsilon_{it}. \quad \text{(EQ 4)}$$

The *ZIP* (zero-inflated Poisson) command was employed for the exposure scores, as these were count variables which had Poisson distributions,

$$ln(\lambda^{j}{}_{it})=\beta^{j}{}_{0}+\beta^{j}{}_{1}(\text{centered age})_{\mathrm{it}}+\beta^{j}{}_{2}(\text{centered age})^{2}{}_{\mathrm{it}} \quad \text{(EQ 5)}$$

To identify the number of classes, we compared the Bayesian information criterion (BIC) for successive models with the same class structure (e.g., linear) but different numbers of classes. In this procedure, we started with one class and added successive classes, examining change in BIC, as indicated by 2(ΔBIC), to determine if goodness of fit of the model improved, or until the model no longer converged. A 2(ΔBIC) of at least 10 was needed to establish the existence of an additional class (Jones et al., 2001). For each class, we tested both linear and quadratic age terms, centered at age 53, and then eliminated non-significant terms.

RESULTS

Hassles and Uplifts Scores over Age

Table 1 shows the means and standard deviations for the observed hassles and uplifts scores, by three-year age-groups at baseline. The trends in means with age varied depending on the type of scores. For example, the intensity scores for both hassles and uplifts were slightly non-linear but exposure scores decreased. Summary hassle scores continued to decrease until the 70s but rose again in the 80s, whereas summary uplift scores decreased until 80s. Across age, the NAS men had higher uplifts scores than hassles scores, regardless of the score type.

Trajectories of Hassles and Uplifts

Intensity scores—Computing multilevel models across age (see Table 2) yielded a significant negative effect of age on hassles intensity, $B_1 = -.007$, $p < .05$, which was offset by a significant positive age quadratic coefficient, $B_2 = .0003$, $p < .001$. Hassles intensity showed a shallow U-shape trajectory, decreasing until about age 67, and then increasing again (Figure 1a). In contrast, age showed a positive linear term on uplifts intensity scores, $B_1 = .010$, $p < .001$, but a negative quadratic term which approached significance, $B_2 = -.0002$, $p = .068$). In other words, uplifts intensity increased until about age 80 but then levelled off (Figure 1a). For both hassles and uplifts, the age-related random effects were significant, $\chi^2(3) = 498.32$, $p < .001$ for hassles; $\chi^2(3) = 1130.02$, $p < .001$ for uplifts, suggesting individual differences in the intercepts and age effect.

Exposure scores—The linear age term for exposure scores was significant and negative, $B_1 = -.018$, $p < .01$, but the quadratic term was not significant, $B_2 = -.0001$, ns (see Table 2). As indicated in Figure 1b, hassles exposure decreased from mid- to late life. In contrast, for uplifts, the linear term for age was positive and significant, $B_1 = .01$, $p < .01$, and the significant quadratic was negative, $B_2 = -.001$, $p < .001$. The resulting trajectory showed an increase from the 50's to about age 62, and then a decrease thereafter (see Figure 1b). Again, the random effects for both models were significant, $\chi^2(3) = 18530.17$, $p < .001$ for hassles; $\chi^2(3) = 11833.74$, $p < .001$ for uplifts, suggesting age-related individual differences in the intercepts and age effect.

Summary scores—The linear age term was negative for hassles, $B = 1.72$, $p < .001$, and the quadratic effect was also significant, $B = .019$, $p < .01$ (see Table 2). The summary hassles score showed a shallow U-curve with age, with the trajectory declining until about age 76, and then increasing through the 80s (Figure 1c). In contrast, the linear age term for the summary uplifts scores was not, $B = .124$, ns; however, the quadratic term was significant, $B = -.019$, $p < .01$. Uplifts showed an accelerated decrease with age. For both outcomes, the age-related random effects were significant, $\chi^2(3) = 1317.12$, $p < .001$ for hassles and $\chi^2(3) = 1168.82$, $p < .001$ for uplifts.

The Question of Age Convergence

One problem with interpreting age vs. context (or cohort) effects is that the NAS men varied widely in age at the start of this study. Sliwinski, Hoffman, and Hofer (2010) recommended examining the extent to which age convergence holds, which essentially compares the within vs. between person variance in age for a particular analysis. Coefficients range between 0 and 1, with smaller values indicating more within-person variance and larger ones more between-person variance.

We calculated the “mixing weight ω” following Sliwinski et al. (2010). The linear hassles intensity score could not be calculated, as the denominator was 0. However, for the quadratic term, $\omega = .178$, indicating that this was primarily an age effect. For uplifts intensity, both the linear (.33) and quadratic (.34) mixing terms indicated the predominance of age effects. In contrast, the hassles exposure linear and quadratic mixing weights were 1, indicating cohort (or birth year) effects. The uplifts exposure ω coefficients were not calculable, indicating neither age nor cohort effects. Interestingly, the hassles and uplifts summary ω coefficients were more likely to exhibit age effects. For the hassles summary scores, the linear and quadratic mixing weights were 0.117 and 0.070, respectively, indicating primarily age effects. For uplifts summary scores, there were no age effects for the linear term, but the quadratic term indicated primarily age effects (0.151).

Classes of Hassles and Uplifts Trajectories

To determine the classes of the hassles and uplifts scores using GBM, we started with one class and added successive classes, examining change in BIC, as indicated by 2(ΔBIC), to determine whether goodness of fit of the model improved, or until the model no longer converged. A 2(ΔBIC) of at least 10 was needed to establish the existence of an additional class (Jones et al., 2001). Tables 3 and 4 present the results of the GBM analyses, with Table 3 showing the fit for different numbers of classes, and Table 4 presenting the parameter estimates for the resulting “best” class for each outcome.

Intensity scores—The model fit improved for hassles intensity scores until we added a fifth class, at which step the 2(ΔBIC) had a negative value of −16.54 (see Table 3). Similarly, the model fit for uplifts also improved until we added the fifth class, 2(ΔBIC) = −0.02. Thus, a four class solution was the best fit for both intensity of hassles and uplifts.

As can be seen in Table 4 and Figure 2a, three of the classes in both measures did not have significant linear trends across age, and basically represented classes that remained consistently low, medium, and high on average (Classes 1, 2, and 4, respectively). Only 30% of the men were in the stable hassles classes, as opposed to 80% of men who were in the stable uplifts classes. Class 3 in both measures had significant quadratic terms. However, for the hassles intensity scores, the trajectory was a shallow U-curve, with the lowest point between ages 65 and 70 (70%). The non-linear uplifts class showed the mirror image: a shallow inverted U with the peak between ages 65 and 70 (but only 20%). The men in the non-linear uplifts class reported relatively higher scores than the non-linear hassles group.

Exposure scores—Exposure scores for hassles showed a much more complex pattern (see Tables 3 and 4). Ten classes were identified, nearly all of which were non-linear and had roughly the same percentage of men (range = 4 – 17%) (see Figure 2b). Thus, we did not attempt to individually characterize these classes, but rather note some general tendencies. The men in two of the classes (4 and 5) showed relatively stable levels of moderate hassles, while Class 10 showed a linear decrease from very high initial levels. The other classes showed varying forms of non-linear trajectories, with some showing quadratic decreases and others quadratic increases.

The uplifts exposure showed a similarly complex pattern, with nine classes identified, most of which were non-linear. Again, the men were roughly equally distributed across classes, with the largest having only 26% of the sample. Three groups showed relative declines from high and medium-level intercepts (Classes 4, 6, and 8), one was relatively stable with low levels of uplifts (Class 1), and the rest showed different non-linear patterns. Interestingly, three groups (Classes 5, 7, and 9) had quadratic slopes with peaks at ages 74, 68, and 62, respectively, while Class 3 was a dramatic U-shaped curve with a nadir around age 70. Finally, the men in Class 2 started with low levels of uplifts but showed a dramatic increase in later life starting at age 65.

Summary scores—The results for the summary scores were more similar to those for the intensity scores than the exposure scores. Three classes were identified for the hassles summary score, and four for uplifts summary scores (see Table 3). For hassles summary scores, both Classes 1 and 3 had significant intercept, linear and quadratic terms, while for Class 2 only the intercept and linear terms were significant (see Table 4). For the uplifts summary scores, only the intercept was significant for three classes (Classes 1, 3, and 4), while Class 2 had significant intercept, linear, and quadratic terms. As seen in Figure 2c, most of the men (67%) were in the low, relatively stable hassles summary class and reported very few hassles over time. The quadratic term was significant, indicating a slight decrease from mid- to late life, and a very slight increase after about age 75. In contrast, the men in Class 2 (29%) were characterized by medium level intercepts, and showed a more pronounced but still shallow U-related change with age. Finally, there was a small (3.68%) class characterized by high, stable slopes. These men seemed to have high levels of stress and may be a chronic stress group.

For the summary uplifts score, four classes were identified. As Table 3 indicates, solving for five classes did not significantly increase the fit, 2(ΔBIC) = .90, so we kept the four-class solution. Interestingly, Table 4 showed that three classes had no significant linear terms, suggesting no changes in uplifts with age. Inspection of Figure 2a showed a similar pattern to hassles, but with some important differences. In contrast to hassles, it was the middle, nonlinear class that was the most frequent (49%), and the slope was more of an inverted U, with slight increases up until about age 65 and then a sharp decline thereafter. The low, stable uplifts group was the next largest, at 27%. Further, those with high, stable uplifts split into two groups. The high, stable group (22%) reported about the same number of uplifts as the high, stable hassles group, but then there was a small group (3%) that reported a very high level of hassles which also showed no change with age.

Comparing Class Memberships in Hassles and Uplifts by Intensity

Last, we examined the overlap in class memberships in intensity scores only, as we were most interested in the relative balance between patterns of positive and negative appraisals (and the exposure scores clearly reflected individual differences in environmental contexts). Table 5 presents the number men in each of the overlapping hassles and uplifts intensity classes, with percentage of total sample size in parentheses). The classes were not independent, $\chi^2(9) = 213.74$, $p < .001$. Most of the sample was in one of three classes: medium, non-linear hassles and low uplifts ($n = 299$), medium stable uplifts ($n = 501$), or medium non-linear uplifts ($n = 180$). Thus, most NAS men were variable in their ratings of hassles intensity but relatively stable in their ratings of uplifts intensity. This is contrary to our hypothesis that positive and negative processes would be roughly parallel.

DISCUSSION

To examine aspects of emotion regulation in context, we analyzed trajectories of hassles and uplifts in middle through late adulthood using longitudinal data over 16 years. We separated hassles and uplifts scores into three different types: intensity, exposure, and summary scores. Regardless of the score type, hassles and uplifts showed different patterns of trajectories over age, most of which were non-linear.

Overall Trajectories

Intensity scores were examined as an indicator of one aspect of emotion regulation in context, namely, appraisal processes. Results showed modest changes in intensity of both hassles and uplifts, but in opposite directions. The intensity ratings of hassles decreased until about age 67 and increased thereafter. In contrast, uplifts intensity scores increased gradually until age 80 and then levelled off. This supports both of the contrasting developmental theories of emotion regulation – the increase (or stability) of positive affect (cf., Carstensen et al., 2011; Charles et al., 2010) and the increase in negative affect in late life (Baltes & Smith, 2003).

These findings also shed light on some of the discrepancies in the cross-sectional literature on hassles and daily stressors, which variously show lower hassles with age (Almeida & Horn, 2004) and no differences between older and younger groups (Stawski et al., 2008). Our (shallow) U-shaped results in hassles intensity trajectories suggest that hassles decrease with age until about age 67, supporting Almeida and Horn, but then increase thereafter. Given the average age of Stawski et al.'s older sample was 80, it may be that the comparison of 80-year-olds with younger adults missed the non-linear change in mid-life.

The increase in uplifts intensity until age 80, which then the levelled off, contradicted earlier cross-sectional and some longitudinal findings that older adults report less positive affect (Costa et al., 1987; Diener, Sapyta, & Suh, 1998) or that found no age differences (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Charles et al., 2001). However, it is similar to Carstensen et al.'s (2011) findings of increases in positive affect until about age 60, but in our study uplifts increased until about age 80. This difference might be explained by Kunzmann et al.'s (2000) study, which showed that controlling for functional limitations revealed higher levels of positive affect with age. This suggests that personal and/or contextual factors may obscure older adults' developmental changes in emotion regulation. We argue that separating exposure from intensity better differentiates between contextual and developmental effects on emotion regulation. This is supported by the age convergence analyses, which suggested developmental (age) effects for intensity scores, but contextual (cohort) effects of exposure scores.

With regard to exposure, our findings of linear decline in hassles are similar to daily diary findings by both Almeida and Horn (2004) and Stawski et al. (2008). Our findings of increases in uplifts exposure until age 62 and decreases thereafter supports Charles et al.'s (2010) longitudinal findings documenting similar decreases. Despite this decrease in uplifts exposure with age, uplifts levels were generally higher than hassles levels, supporting Carstensen al.'s (2011) findings of a positive affectivity balance, although they did converge more in late life.

The summary hassles and uplifts trajectories are more global assessments which reflected developmental trends in intensity as well as contextual exposure. Despite the linear decrease in hassles exposure, the summary hassles scores were nonlinear, decreasing until about age 78 and then increasing slightly. This reflects the contribution of developmental changes in intensity to the summary scores. In contrast, uplifts intensity showed a linear increase with age, but exposure showed a non-linear decrease. Thus, summary uplifts scores showed an accelerated decrease after age 60, but not as steeply as the exposure scores, as these were mitigated by the increase in uplifts intensity.

Taken together, these findings can be interpreted in a number of interesting ways. First, the intensity and exposure scores for both hassles and uplifts showed different patterns. For both, intensity increased slightly, although exposure went down. One interpretation might be that the number of hassles declines, but their appraised stressfulness increases (which is what one might expect as individuals face the challenges of loss and decline in late life). However, the increase in intensity might also reflect problems in self-regulation in late life, given possible declines in coping resources such as cognition, social support, and so on.

This is countered by the fact that although exposure to uplifts goes down, their intensity goes up. As mentioned earlier, this supports the positivity bias found other studies in late life (Carstensen et al., 2011). The combination, however, shows that the intensity appraisals can moderate the change in exposure. Although exposure goes down, intensity goes up, resulting in rather flat curves for hassles, and mitigating the decrease in uplifts.

Nonetheless, there appeared to be a convergence of hassles and uplifts scores in very late life both in the longitudinal Figure 1 and in the cross-sectional Table 1. This is potentially troubling, as it suggests that the uplifts exposure, accompanied by an increase in hassles intensity, might point to a less satisfying life experience starting in late mid-life. Indeed, Mroczek and Spiro (2005) found that life satisfaction peaked in the NAS men at about age 65 and decreased thereafter.

There are a number of reasons why exposure to uplifts might decrease with age. One is a decrease in social roles – with declines in active parenting and work roles may come decreases in opportunity for uplifts. Another might be simple declines in energy or the curtailment of experiences with increases in physical health problems. It may also be that experience tempers the joy and excitement seen earlier in life when individual experiences may be new. For example, contrast the difference in excitement between a child's trip to a theme park, an adolescent's first trip to Europe, and the grandparent's experience of similar events in late life. Experience shows us that not all trips are pleasant – lines can be long at theme parks, and flights to Europe can be delayed or distinctly unpleasant. Thus, older adults' views of uplifts may become tempered, and individuals may achieve a greater affect balance in late life.

Differences in Developmental Trends

Another interpretation is that there are individual differences in developmental trajectories, which was supported by our GBM analyses. For both hassles and uplifts, there were remarkable differences in the number of classes found for intensity and exposure scores, with fewer classes for intensity scores. Both hassles and uplifts showed very similar classes. There were four different classes of trajectories, three of which reflected stability: low, medium and high. Both had one non-linear class – for hassles, there was one group which had a shallow U curve, with decreases until about age 67 and increasing thereafter. The non-linear uplifts intensity class showed the opposite pattern, with increases until age 67 and decreases thereafter.

The remarkable contrast, though, was that the non-linear class for hassles included 70% of the sample, while only 20% of the sample showed change in uplifts. This pattern of results supports Diener et al.'s (2006) modified hedonic treadmill theory for positive affect. Why there were almost normative changes in hassles intensity, however, is not clear. This suggests that emotion regulation ability increases up through young old age, but then decreases again in very late life, supporting Baltes and Smith's (2003) notion of a difficult fourth age.

There were marked individual differences in patterns of exposure to both hassles and uplifts, with 10 and 9 different classes identified, respectively. We suspect that these classes reflect individual differences in life course variables – changes in social roles such as retirement, widowhood, and remarriage; specific events, such as losses (family, friends) or gains (e.g., grandchildren); and other factors such as socioeconomic or health status (see Mancini, Bonanno, & Clark, 2011). Some individuals showed marked increases in uplifts in late life.

The summary score classes were far more similar to intensity classes, with some interesting differences. Only 4% were in the stable category for high hassles – 96% of the sample showed U-shaped curves with age. Those with very low hassle scores showed decreases until their mid-70s, and only a slight uptick thereafter. Those with medium hassles scores also showed decreases until their mid-70s but with a slightly greater increase thereafter. For uplifts, 49% were now in the change group, with decreases after age 70. Thus, emotion regulation, especially for positive events, may be relatively stable, but the press of contextual factors may result in change. This complex pattern suggests that both personality and contextual factors combine in complex ways to affect both appraisal (Aldwin et al., 2011; Lazarus & Folkman, 1984) and developmental processes (Lerner, 2006).

Finally, we examined whether individuals exhibited similar patterns of change and stability in hassles and uplifts. For example, if hassles were relatively stable, were uplifts also stable? The answer was, simply, not really. Less than 10% of the sample was in comparable stability groups (e.g., low-low, medium-medium, or high-high). Approximately 39% of the sample had membership in the medium non-linear hassles and medium stable uplifts classes, and 23% were in the medium non-linear hassles and low uplifts classes. Thus, negative and positive experiences seem to show different trajectories within the same person.

Limitations

The sample consisted largely of white men, limiting generalizability. While this reflected the demographics of Boston in the 1960's when the NAS began, other results may be found in samples with women and minorities. The second concerns growth mixture models. The specific results with the hassles and uplifts exposure classes are not likely to be replicated in other samples, given that these undoubtedly reflect individual differences in family and other social contexts, as well as life course events. Our intent with these analyses was not to definitively identify all possible types of patterns of hassles and uplifts exposure, but rather to contrast exposure patterns with intensity ratings, which we assumed reflect emotion regulation patterns.

Another limitation is comparability with the more general literature on developmental changes in affect. In general, affect measures assess individual characteristics, while measures of hassles and uplifts assess contextual characteristics. However, from a developmental systems point of view, it is very difficult to disentangle the individual from his/her context. Thus, affect undoubtedly reflects contextual factors, while feelings about the context are influenced by one's emotional state. Thus, we feel that separate analyses of intensity ratings from exposure ratings provide a more complete approach to examining emotion regulation processes in late life rather than simply assessing affect.

These limitations are more than counterbalanced by the strength of the longitudinal analyses which resolved contrasting findings in the cross-sectional literature and showed that the different theories were all partially supported, depending upon whether intensity, exposure, or summary scores were examined.

Summary and Future Research

We examined longitudinal changes in hassles and uplifts in the context of theories of emotion regulation, specifically contrasting hedonic treadmill theories with those arguing for developmental change (both positive and negative). Our argument that emotion regulation processes should not be divorced from contextual variation was supported. While intensity ratings, especially for uplifts (presumably reflecting positive affect) were fairly stable, this was overshadowed by contextual variation – for about half of the sample, decreasing exposure to uplifts resulted in overall lower summary uplifts scores. In contrast, change in appraisals of hassles intensity (presumably reflecting negative affect) was much more variable, with nearly all of the sample showing decreases in hassles until the 70's and increases their after. Emotion regulation processes may moderate the effect of exposure, with increases in intensity scores either intensifying the effect of exposure to hassles or mitigating the decrease in exposure to uplifts. Thus, evidence was found for all of the theoretical models examined here, suggesting that both hedonic treadmill and developmental theories reflect only some aspects of emotion regulation with age, rather like the blind men examining the elephant. Further research should further examine longitudinal change of affect in context in more diverse populations, and extend these analyses to other aspects of the regulatory process, including coping strategies. Further, it is important to determine the real-world relevance, if any, of the differences we observed in in hassles and uplifts trajectories. Finally, understanding the person and contextual factors which influence the formation of different trajectory patterns is also a crucial next step.

Acknowledgments

This study was funded by NIH grants R01 AG032037, AG002287, and AG018436, as well as a Merit Review and a Research Career Scientist Award from the CSR&D Service, US Department of Veterans Affairs. The NAS is a research component of the Massachusetts Veterans Epidemiology Research and Information Center (MAVERIC) and is supported by VA CSP/ERIC. The views expressed in this paper are those of the authors and do not necessarily represent the views of the US Department of Veterans Affairs. We are grateful to Dr. Alan Acock for his advice regarding the statistical analyses.

References

Aldwin, CM. Stress, coping, and development. 2. New York: Guilford; 2007.

Aldwin CM, Sutton KJ, Chiara G, Spiro A III. Age differences in stress, coping, and appraisal: Findings from the Normative Aging Study. The Journals of Gerontology Series B, Psychological Sciences and Social Sciences. 1996; 51(4):P179–88.

Aldwin, CM.; Skinner, E.; Zimmer-Gebeck, M.; Taylor, A. Coping and self-regulation across the lifespan. In: Fingerman, K.; Berg, C.; Antonucci, T., editors. Handbook of lifespan psychology. New York, NY: Springer; 2011. p. 561-588.

Aldwin, CM.; Park, CL.; Spiro, A, III. Health psychology and aging: Moving to the next generation of research. In: Aldwin, CM.; Park, CL.; Spiro, A., III, editors. Handbook of health psychology and aging. New York, NY: Guilford Press; 2007. p. 413-426.

Almeida DM. Resilience and vulnerability to daily stressors assessed via diary methods. Current Directions in Psychological Science. 2005; 14(2):64–68.10.1111/j.0963-7214.2005.00336.x

Almeida, DM.; Horn, MC. Is daily life more stressful during middle adulthood?. In: Brim, O.; Ryff, C.; Kessler, R., editors. How healthy are we? A national study of well-being at midlife. Chicago, IL: University of Chicago Press; 2004. p. 425-451.

Almeida, DM.; Piazza, J.; Stawski, RS.; Klein, LC. The speedometer of life: Stress, health and aging. In: Schaie, KW.; Willis, SL., editors. Handbook of the psychology of aging. 7. Oxford: Elsevier; 2011. p. 191-206.

Baltes PB, Smith J. New frontiers in the future of aging: From successful aging of the young old to the dilemmas of the fourth age. Gerontology. 2003; 49:123–135. 1159/000067946. [PubMed: 12574672]

Berg CA, Upchurch R. A developmental-contextual model of couples coping with chronic illness across the adult life span. Psychological Bulletin. 2007; 133(6):920–54.10.1037/0033-2909.133.6.920 [PubMed: 17967089]

Birditt KS, Fingerman KL, Almeida DM. Age difference in exposure and reactions to interpersonal tensions: A daily diary study. Psychology and Aging. 2005; 20(2):330–340.10.1037/0882-7974.20.2.330 [PubMed: 16029096]

Boeninger DK, Shiraishi RW, Aldwin CM, Spiro A III. Why do older men report low stress ratings? Findings from the Veterans Affairs Normative Aging Study. The International Journal of Aging and Human Development. 2009; 68(2):149–170.10.2190/AG.68.2.c

Bossé R, Aldwin CM, Levenson MR, Spiro A III, Mroczek DK. Change in social support after retirement: Longitudinal findings from the Normative Aging Study. Journals of Gerontology, Psychological Sciences. 1993; 48:P210–P219.

Brickman P, Coates D, Janoff-Bulman R. Lottery winners and accident victims: Is happiness relative? Journal of Personality and Social Psychology. 1978; 36:917–927. [PubMed: 690806]

Carstensen LL, Pasupathi M, Mayr U, Nesselroade JR. Emotional experience in everyday life across the adult life span. Journal of Personality and Social Psychology. 2000; 79:644–655.10.1037/0022-3514.79.4.6 [PubMed: 11045744]

Carstensen, LL.; Mikels, J.; Mather, M. Aging and the intersection of cognition, motivation, and emotion. In: Birren, JE.; Schaie, KW., editors. Handbook of the psychology of aging. 6. San Diego: Academic Press; 2006. p. 343-362.

Carstensen LL, Turan B, Scheibe S, Ram N, Ersner-Hershfield Samanez-Larkin GR, Brooks KP, et al. Emotional experience improves with age: evidence based on over 10 years of experience sampling. Psychology and Aging. 2011; 26(1):21–33.10.1037/a0021285 [PubMed: 20973600]

Charles ST. Strength and vulnerability integration: A model of emotional well-being across adulthood. Psychological Bulletin. 2010; 136(6):1068–91.10.1037/a0021232 [PubMed: 21038939]

Charles, ST.; Carstensen, LL. Emotion regulation and aging. In: Gross, JJ., editor. Handbook of emotion regulation. 6. New York: Guilford Press; 2007. p. 307-327.

Charles ST, Luong G, Almeida DM, Ryff C, Sturm M, Love G. Fewer ups and downs: Daily stressors mediate age differences in negative affect. Journal of Gerontology: Psychological Sciences. 2010:279–286.10.1093/geronb/gbq002

Charles ST, Reynolds CA, Gatz M. Age-related differences and change in positive and negative affect over 23 years. Journal of Personality and Social Psychology. 2001; 80:136–151.10.1037/0022-3514.80.1.136 [PubMed: 11195886]

Costa PT, McCrae RR. Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. Journal of Personality and Social Psychology. 1980; 38:668–678. [PubMed: 7381680]

Costa PT, McCrae RR, Zonderman AB. Environmental and dispositional influences on well-being: Longitudinal follow-up of an American sample. British Journal of Psychology. 1987; 78:299–306. [PubMed: 3620790]

DeLongis, Anita; Folkman, S.; Lazarus, RS. The impact of daily stress on health and mood: Psychological and social resources as mediators. Journal of Personality and Social Psychology. 1988; 54(3):486–495.10.1037/0022-3514.54.3.486 [PubMed: 3361420]

Diener E, Lucas RE, Scollon CN. Beyond the hedonic treadmill: Revising the adaptation theory of well-being. The American Psychologist. 2006; 61(4):305–14.10.1037/0003-066X.61.4.305 [PubMed: 16719675]

Diener E, Sapyta JJ, Suh E. Subjective well-being is essential to well-being. Psychological Inquiry. 1998; 9:33–37.

Eisenberg N, Zhou Q. Regulation from a developmental perspective. Psychological Inquiry. 2001; 11:167–171.

Folkman S, Moskowitz JT. Positive affect and the other side of coping. American Psychologist. 2000; 55(6):647–654.10.1037//0003-066X.55.6.647 [PubMed: 10892207]

Griffin PW, Mroczek DK, Spiro A III. Variability in affective change among aging men: Longitudinal findings from the VA Normative Aging Study. Journal of Research in Personality. 2006; 40:942–965.

Hox, J. Multilevel analysis: Techniques and applications. 1. New York: Routledge; 2002.

Jain S, Mills PJ, Von Känel R, Hong S, Dimsdale JE. Effects of perceived stress and uplifts on inflammation and coagulability. Psychophysiology. 2007; 44(1):154–60.10.1111/j.1469-8986.2006.00480.x [PubMed: 17241151]

Jones BL, Nagin DS, Roeder K. A SAS procedure based on mixture models for estimating developmental trajectories. Sociological Methods and Research. 2001; 29(3):374–393.

Kanner AD, Coyne JC, Schaefer C, Lazarus RS. Comparison of two modes of stress measurement: Daily hassles and uplifts versus major life events. Journal of Behavioral Medicine. 1981; 4(1)

Kunzmann U, Little T, Smith J. Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal findings from the Berlin Aging Study. Psychology and Aging. 2000; 15:511–526. [PubMed: 11014714]

Klumb PL, Baltes MM. Adverse life events in late life: Their manifestation and management in daily life. International Journal of Stress Management. 2004; 11:3–20.10.1037/1072-5245.11.1.3

Lazarus, RS.; Folkman, S. Stress, appraisal, and coping. New York, NY: Springer; 1984.

Lerner, RM. Developmental science, developmental systems, and contemporary theories of human development. In: Lerner, Richard M.; Damon, W., editors. Handbook of child psychology. Vol. 1. Theoretical models of human development. Hoboken, NJ: John Wiley & Sons; 2006. p. 1-17.

Mancini AD, Bonanno GA, Clark AE. Stepping off the hedonic treadmill. Journal of Individual Differences. 2011; 32(3):144–152.10.1027/1614-0001/a000047

Maybery DJ, Jones-Ellis J, Neale J, Arentz A. The positive event scale: Measuring uplift frequency and intensity in an adult sample. Social Indicators Research. 2006; 78:61–83.10.1007/s11205-005-4096-8

Mroczek DK, Kolarz CM. The effect of age on positive and negative affect: A developmental perspective on happiness. Journal of Personality and Social Psychology. 1998; 75:1333–1349. [PubMed: 9866191]

Mroczek DK, Spiro A III. Change in life satisfaction during adulthood: Findings from the Veterans Affairs Normative Aging Study. Journal of Personality and Social Psychology. 2005; 88:189–202.10.1037/0022-3514.88.1.189 [PubMed: 15631584]

Pearlin LI, Mullan JT, Semple SJ, Skaff MM. Caregiving and the stress process: An overview of concepts and their measures. The Gerontologist. 1990; 30:583–594.10.1093/geront/30.5.583 [PubMed: 2276631]

Pluess M, Wurmser H, Buske-Kirschbaum A, Papousek M, Pirke KM, Hellhammer D, Bolten M. Positive life events predict salivary cortisol in pregnant women. Psychoneuroendocrinology. 2012; 37(8):1336–40.10.1016/j.psyneuen.2012.01.006 [PubMed: 22309824]

Rabe-Hesketh, S.; Skrondal, A. Multilevel and longitudinal modeling using Stata. 2. College Station, TX: Stata Press; 2012.

Rose, CL.; Bell, B. Predicting longevity: Methodology and critique. Lexington, MA: Heath Lexington Books; 1971.

Sliwinski M, Hoffman L, Hofer SM. Evaluating convergence of within-person change and between-person age differences in age-heterogeneous longitudinal studies. Research in Human Development. 2010; 7:45–60.10.1080/15427600903578169 [PubMed: 20671986]

Smith, J.; Fleeson, W.; Geiselman, B.; Settersten, RA., Jr; Kunzman, U. Sources of well-being in very old age. In: Baltes, PB.; Mayer, KU., editors. The Berlin Aging Study: Aging from 70 to 100. Cambridge, UK: Cambridge University Press; 1999. p. 450-472.

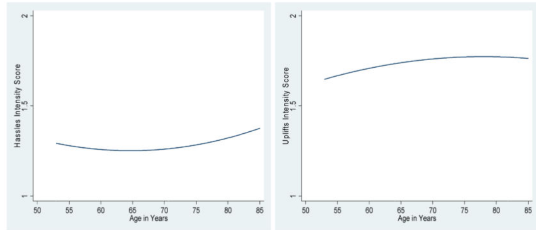
Spiro, A., III; Bossé, R. The Normative Aging Study. In: Maddox, G., editor. Encyclopedia of aging. 3. New York: Springer; 2001. p. 744-746.

StataCorp. Stata Statistical Software: Release 12. College Station, TX: StataCorp LP; 2011.

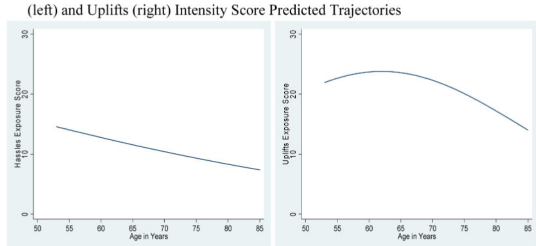
Stawski RS, Sliwinski MJ, Almeida DM, Smyth JM. Reported exposure and emotional reactivity to daily stressors: The roles of adult age and global perceived stress. Psychology and Aging. 2008; 23(1):52–61.10.1037/0882-7974.23.1.52 [PubMed: 18361654]

Tennen, H.; Affleck, G. Benefit-finding and benefit-reminding. In: Snyder, CR.; Lopes, SJ., editors. The handbook of positive psychology. New York, NY: Oxford University Press; 2002. p. 584-597.

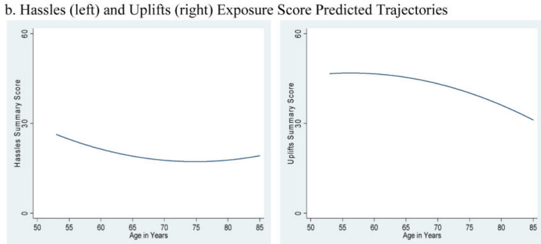
Zautra, AJ. Emotions, stress and health. New York: Oxford University Press; 2003.



a. Hassles (left) and Uplifts (right) Intensity Score Predicted Trajectories



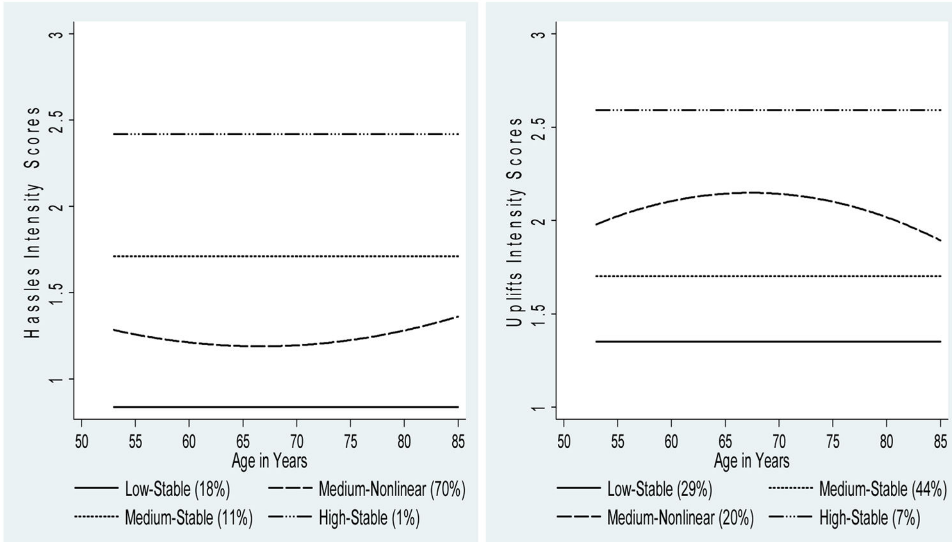
b. Hassles (left) and Uplifts (right) Exposure Score Predicted Trajectories



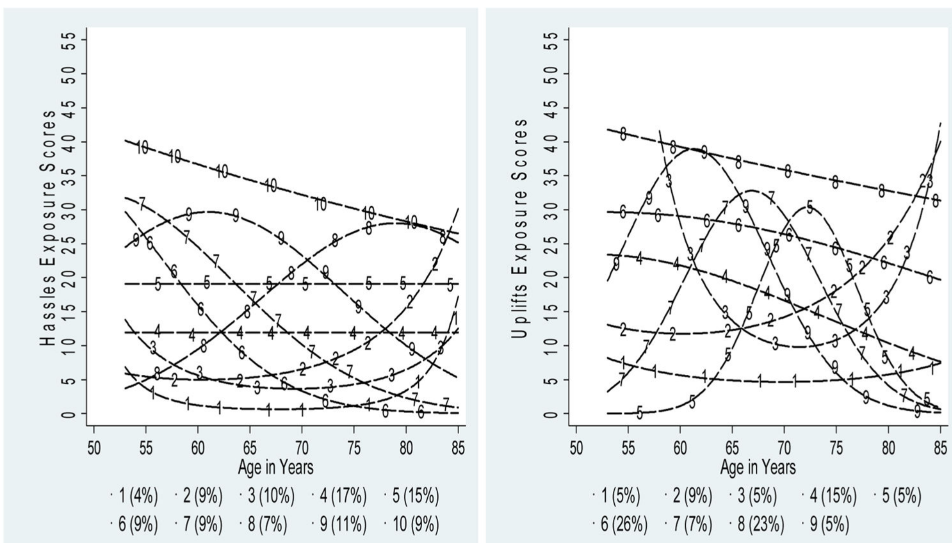
c. Hassles (left) and Uplifts (right) Summary Score Predicted Trajectories

Figure 1.

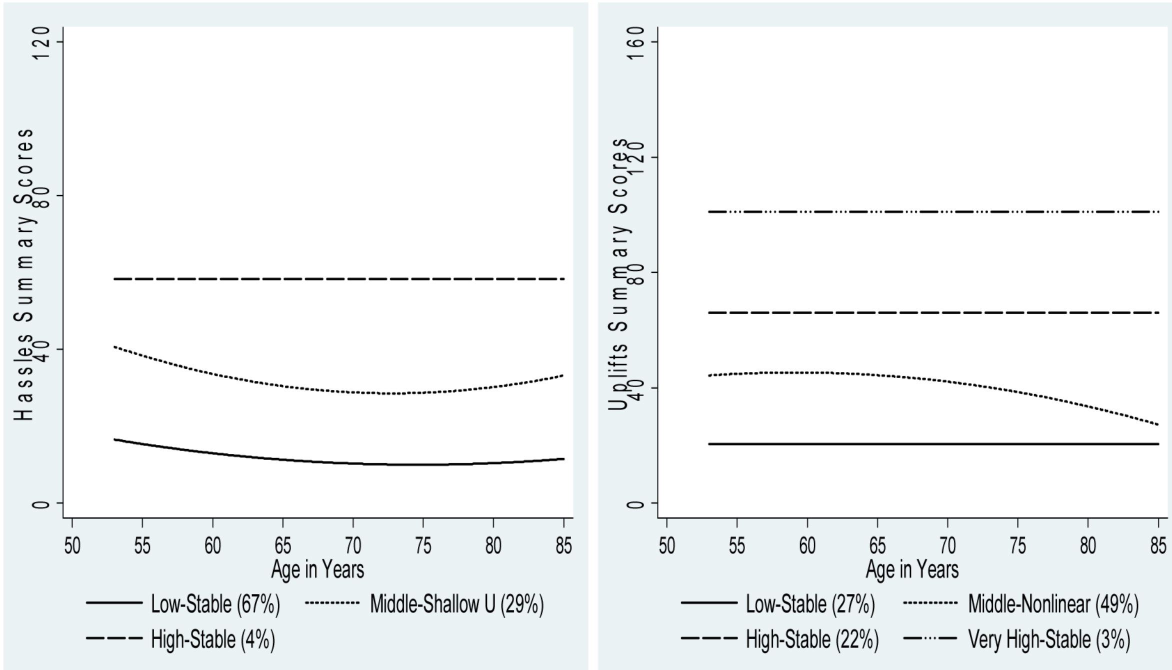
Predicted Trajectories of Hassles and Uplift Scores



a. Predicted Trajectories for Hassles (Left) and Uplifts (Right) Intensity Score Classes



b. Predicted Trajectories for Hassles (Left) and Uplifts (Right) Exposure Score Classes



c. Predicted Trajectories for Hassles (Left) and Uplifts (Right) Summary Score Classes

Figure 2.
Predicted Trajectories for Hassles and Uplifts Score Classes

Table 1

Hassles and Uplifts Means and SDs by Age Group

	Intensity (range 1 – 3)					
	Hassles			**Uplifts**		
Age	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***
53–55	99	1.27	.31	102	1.68	.39
56–58	202	1.26	.29	206	1.74	.44
59–61	315	1.27	.29	328	1.72	.43
62–64	468	1.27	.29	487	1.74	.43
65–67	565	1.26	.34	583	1.74	.44
68–70	591	1.27	.32	612	1.76	.45
71–73	501	1.27	.33	521	1.74	.46
74–76	401	1.31	.37	412	1.76	.47
77–79	259	1.32	.33	279	1.77	.49
80–82	170	1.38	.40	170	1.76	.48
83–85	84	1.40	.42	84	1.40	.42
	Exposure (range 0 – 53)					
	Hassles			**Uplifts**		
Age	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***
53–55	104	18.38	11.58	104	27.93	11.99
56–58	207	16.87	11.67	207	27.92	11.71
59–61	327	16.10	10.96	327	16.09	10.96
62–64	489	15.88	11.24	489	26.17	11.50
65–67	589	14.52	10.97	588	25.48	12.01
68–70	623	13.48	10.23	622	24.53	11.24
71–73	533	13.64	10.48	531	23.56	11.14
74–76	435	13.12	10.28	424	21.93	11.65
77–79	287	13.92	10.25	288	21.60	11.21
80–82	177	12.99	9.78	176	20.58	11.76
83–85	95	13.55	10.93	95	19.43	11.98
	Summary (range 0 – 159)					
	Hassles			**Uplifts**		
Age	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***
53–55	104	23.78	16.26	104	48.34	25.84
56–58	207	21.92	16.41	207	49.64	26.22
59–61	327	20.87	15.92	331	47.58	25.75
62–64	489	20.85	16.90	489	46.62	25.66
65–67	589	18.74	16.19	588	45.44	26.47

NIH-PA Author Manuscript

NIH-PA Author Manuscript

Summary (range 0 – 159)

	Hassles			Uplifts		
Age	***n***	***Mean***	***SD***	***n***	***Mean***	***SD***
68–70	623	17.44	15.06	622	44.36	25.97
71–73	533	17.74	15.36	531	41.77	23.84
74–76	435	17.38	15.36	424	38.51	23.10
77–79	287	18.59	15.69	288	38.34	23.03
80–82	177	17.96	15.08	176	36.50	24.03
83–85	95	19.57	17.13	95	33.65	23.33

Table 2

Multilevel Longitudinal Models for Hassles and Uplifts Trajectories over Age

	Intensity			
	Hassles (*n* = 1293)		**Uplifts (*n* = 1306)**	
	B	***SE***	***B***	***SE***
Fixed effects				
Constant	1.292***	.022	1.648***	.029
Age	−.007*	.003	.010**	.004
Age2	.0003***	.0001	−.0002†	.0001
Random effects				
Slope variance	.009	.002	.011	.003
Intercept variance	.170	.025	.335	.028
Residual variances	.258	.004	.299	.005
LR Test vs. Linear Regression χ^2 (df)	χ^2 (3)= 498.32	Prob > χ^2=0.000	χ^2 (3)=1130.02	Prob > χ^2=0.000

	Exposure			
	Hassles (*n* = 1313)		**Uplifts (*n* = 1311)**	
	B	***SE***	***B***	***SE***
Fixed effects				
Constant	2.678***	.065	3.088***	.044
Age	−.018**	.007	.018***	.005
Age2	−.0001	.0002	−.001***	.0001
Random effects				
Slope variance	.074	.003	.047	.002
Intercept variance	1.284	.049	.849	.033
Residual variance	-	-	-	-
LR Test vs. Linear Regression χ^2 (df)	χ^2 (3)= 18530.17	Prob > χ^2=0.000	χ^2 (3)=11833.74	Prob > χ^2=0.000

	Summary			
	Hassles (*n* = 1313)		**Uplifts (*n* = 1311)**	
	B	***SE***	***B***	***SE***
Fixed effects				
Constant	26.300***	1.063	46.637***	1.759
Age	−.830***	.125	.124	.205
Age2	.019***	.004	−.019**	.006
Random effects				
Slope variance	.366	.104	.619	.159
Intercept variance	14.037	.858	23.536	1.471
Residual variance	10.175	.155	16.653	.257

	Summary			
	Hassles (n = 1313)		Uplifts (n = 1311)	
	B	***SE***	***B***	***SE***
LR Test vs. Linear Regression χ^2 (df)	χ^2 (3)= 1317.12	Prob > χ^2 =0.000	χ^2 (3)=1168.82	Prob > χ^2=0.000

Note.

† $p < .1$,

* $p < .5$,

** $p < .01$,

*** $p < .001$

NIH-PA Author Manuscript
NIH-PA Author Manuscript

Table 3

Determining Numbers of Classes for Hassles and Uplifts Trajectories

	Hassles					
	Intensity (n=1293)		Exposure (n=1313)		Summary (n=1313)	
# of Groups	BIC	2(ΔBIC)	BIC	2(ΔBIC)	BIC	2(ΔBIC)
1	−2404.11	-	−24063.55	-	−15689.13	-
2	−2220.06	368.10	−17492.71	13141.68	−15200.95	976.36
3	−2185.75	68.62	−15982.57	3020.28	−15059.00	283.90*
4	−2168.92	33.66*	−15627.24	710.66	False Convergence	
5	−2177.19	−16.54	−15384.23	486.02		
6			−15189.49	389.48		
7			−15136.98	105.02		
8			−14887.54	498.88		
9			−14873.98	27.12		
10			−14820.62*	106.72		
11			False Convergence			

	Uplifts					
	Intensity (n=1306)		Exposure (n=1313)		Summary (n=1311)	
# of Groups	BIC	2(ΔBIC)	BIC	2(ΔBIC)	BIC	2(ΔBIC)
1	−2673.82	-	−21842.53	-	−17731.37	-
2	−2242.32	863.00	−17637.21	8410.64	−17331.72	799.30
3	−2134.31	216.02	−16573.00	2128.42	−17221.38	220.68
4	−2123.68	21.26*	−16268.42	609.16	−17184.97	72.82*
5	−2128.69	−10.02	−16034.52	467.8	−17184.52	.90
6			−15879.26	310.52		
7			−15752.24	254.04		
8			−15683.78	136.92		
9			−15645.42	76.72*		
10			−15645.06	.72		

Note. (ΔBIC) = BIC of the alternative (more complex) model − BIC of the null (simpler) model; 2(ΔBIC) higher than 10 indicates the alternative model is strongly favored (Jones et al, 2001)

* Indicates model selected as "best fitting."

Table 4

Latent Class Growth Analysis Results

Intensity									
Hassles (4 groups)					Uplifts (4 groups)				
Class	**(%)**	**Parameter**	**Estimate**	**S.E**	**Class**	**(%)**	**Parameter**	**Estimate**	**S.E**
1	(17.98)	Intercept	.837***	.072	1	(29.11)	Intercept	1.351***	.022
2	(10.51)	Intercept	1.710***	.042	2	(44.00)	Intercept	1.700***	.027
3	(70.43)	Intercept	1.285***	.036	3	(19.75)	Intercept	1.979***	.076
		Linear	−.014***	.004			Linear	.024*	.010
		Quadratic	.001***	.000			Quadratic	−.001***	.000
4	(1.07)	Intercept	2.420***	.096	4	(7.14)	Intercept	2.592***	.036

Exposure									
Hassles (10 groups)					Uplifts (9 groups)				
Class	**(%)**	**Parameter**	**Estimate**	**S.E**	**Class**	**(%)**	**Parameter**	**Estimate**	**S.E**
1	(4.03)	Intercept	1.920***	.177	1	(5.28)	Intercept	2.100***	.196
		Linear	−.323***	.037			Linear	−.067*	.026
		Quadratic	.011***	.001			Quadratic	.002*	.001
2	(8.99)	Intercept	1.774***	.234	2	(8.72)	Intercept	2.569***	.088
		Linear	−.045†	.023			Linear	−.029**	.011
		Quadratic	.003***	.001			Quadratic	.002***	.000
3	(10.35)	Intercept	2.623***	.122	3	(5.21)	Intercept	5.002***	.224
		Linear	−.163***	.023			Linear	−.295***	.034
		Quadratic	.005***	.001			Quadratic	.008***	.001
4	(17.12)	Intercept	2.482***	.020	4	(15.37)	Intercept	3.152***	.052
							Linear	−.003	.008
5	(14.89)	Intercept	2.949***	.017			Quadratic	−.001*	.000
6	(9.30)	Intercept	3.391***	.070	5	(4.84)	Intercept	−4.720***	.518
		Linear	−.061***	.015			Linear	.846***	.054
		Quadratic	−.004***	.001			Quadratic	−.022***	.001
7	(9.37)	Intercept	3.458***	.084	6	(25.98)	Intercept	3.389***	.034

Exposure

Hassles (10 groups)					Uplifts (9 groups)				
Class	**(%)**	**Parameter**	**Estimate**	**S.E**	**Class**	**(%)**	**Parameter**	**Estimate**	**S.E**
		Linear	−.016	.015			Linear	.000	.005
		Quadratic	−.003***	.001			Quadratic	−.0004*	.0002
8	(6.55)	Intercept	1.305***	.212	7	(6.61)	Intercept	1.180***	.135
		Linear	.156***	.021			Linear	.333***	.021
		Quadratic	−.003***	.001			Quadratic	−.012***	.001
9	(10.89)	Intercept	3.198***	.063	8	(22.99)	Intercept	3.733***	.017
		Linear	.048***	.010			Linear	−.009***	.001
		Quadratic	−.003***	.000	9	(4.98)	Intercept	2.973***	.119
10	(8.51)	Intercept	3.693***	.037			Linear	.166***	.022
		Linear	−.013***	.002			Quadratic	−.010***	.001

Summary

Hassles (3 groups)					Uplifts (4 groups)				
Class	**(%)**	**Parameter**	**Estimate**	**S.E**	**Class**	**(%)**	**Parameter**	**Estimate**	**S.E**
1	(67.11)	Intercept	16.525***	1.066	1	(26.60)	Intercept	20.487***	1.174
		Linear	−.605***	.136	2	(48.75)	Intercept	44.313***	2.350
		Quadratic	.014***	.004			Linear	.330	.281
2	(29.21)	Intercept	40.687***	2.258			Quadratic	−.027***	.009
		Linear	−1.226***	.264	3	(22.09)	Intercept	66.092***	1.240
		Quadratic	.031***	.008	4	(2.55)	Intercept	101.130***	.236
3	(3.68)	Intercept	58.301***	1.606					

Table 5

Cross-tabulation of Hassles and Uplifts Intensity Classes (Total Percent) (N=1,286)

	Uplifts Class			
Hassles Class	**Low-Stable (n=368)**	**Medium-Stable (n=601)**	**Medium-Nonlinear (n=242)**	**High-Stable (n=75)**
Low-Stable (n=156)	61 (4.74)	63 (4.90)	24 (1.87)	8 (0.62)
Medium-Stable (n=102)	8 (0.62)	36 (2.80)	35 (2.72)	23 (1.79)
Medium-Nonlinear (n=1014)	299 (23.25)	501 (38.96)	180 (14.00)	34 (2.64)
High-Stable (n=14)	0 (0.00)	1 (0.08)	3 (0.23)	10 (0.78)