Journal of Gerontology: PSYCHOLOGICAL SCIENCES
2007, Vol. 62B, No. 4, P216–P225

Age Differences in Reactivity to Daily Stressors: The Role of Personal Control

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We examined age and control belief differences in physical and emotional reactivity to daily stressors in four domains: interpersonal, work, network, and home. We combined data from the National Study of Daily Experiences and the Midlife in the United States survey, resulting in 1,031 participants who reported on 7,229 days. Findings from multilevel models suggest that age and control beliefs play an important role in a person's reactivity to interpersonal, network, and work stressors. Specifically, older age and lower perceived constraints were each related to lower emotional and physical reactivity to interpersonal stressors. High mastery buffered the physical effects of work stressors for younger and older adults, and high mastery was important for middle-aged adults' emotional reactivity to network stressors. High constraint was associated with the strongest physical reactivity to network stressors for younger and older adults.

THE present study focuses on age differences in reactivity to multiple domains of daily stressors. We assert that age plays a vital role in determining the psychological and physical consequences of daily stressors (i.e., reactivity). Although some studies have examined age differences in exposure (e.g., Almeida & Horn, 2004) and reactivity to specific stressor domains (e.g., interpersonal; Birditt, Fingerman, & Almeida, 2005), to date no single study has included multiple stressor domains to capture a comprehensive account of age differences in daily stress processes. To this end, we examine age differences in emotional and physical reactivity to daily stressors. We define emotional reactivity as an increase in negative affect and physical reactivity as an increase in physical symptom reports in response to stressors. We examine this reactivity in the stressor domains most often reported by people of all ages: interpersonal, home, work, and network (stressors that happen to close friends or family members; see Almeida & Horn). These domains represent areas where people often derive personal meaning, and they may be particularly important for shifting motivational goals across the adult life span. In addition to studying characteristics of the situation, we also examined how personal control beliefs are involved in this process.

Effects of Daily Stressors

Daily stressors are the routine challenges of day-to-day living, and although they may be relatively minor, they are tangible events that can have immediate negative impacts on physical and psychological well-being (Almeida, 2005; Almeida, Wethington, & Kessler, 2002; Bolger, DeLongis, Kessler, & Schilling, 1989). Daily stressors affect well-being not only by having separate, immediate, and direct effects on emotional and physical functioning, but also by piling up over a series of days to create persistent irritations and overloads that may result in more serious stress reactions such as anxiety and depression (Lazarus, 1999; Zautra, 2003). Some stressors are unhealthier than others, and some individuals are more prone than other individuals to the effects of stressors (Almeida). In the present study we explore domains of daily stressors and characteristics of individuals to examine for whom and under what circumstances reactivity to stressors would be buffered or exacerbated. Specifically, we examine age differences and perceptions of control as personal characteristics that may be important for reactivity to commonly experienced daily stressors. Control is associated with decreased reactivity to stressors (Ong, Bergeman, & Bisconti, 2005) and therefore should be considered within the context of emotional and physical reactivity. Furthermore, stressor domains may vary in their salience across adulthood (e.g., Clark-Plaskie & Lachman, 1999), so the emotional and physical impact of those stressors could be associated with age. For example, older age has been associated with decreased emotional reactivity to interpersonal stressors (Birditt et al., 2005), and self-determination theory (Deci & Ryan, 1980, 2000) suggests that older adults are able to pursue their valued outcomes (e.g., maintaining interpersonal relationships) even when faced with constraints.

Age Differences in Reactivity to Stressors

Some researchers suggest that older adults are less emotionally reactive to stressors than younger adults are (e.g., Uchino, Berg, Smith, Pearce, & Skinner, 2006). Certain life-span theories of emotion regulation are also consistent with the idea of lessened emotional reactivity to stress with age (Carstensen, 1995; Carstensen, Isaacowitz, & Charles, 1999; Labouvie-Vief & DeVoe, 1991; Lang, Staudinger, & Carstensen, 1998). For example, socioemotional selectivity theory (Carstensen et al.) posits better regulation of emotion among older adults, and better emotion regulation is a key aspect of optimal aging (Baltes & Baltes, 1990; Baltes, Lindenberger, & Staudinger, 1998; Heckhausen & Schulz, 1995; Magai, 2001). Birditt and colleagues (2005) found that older adults were less emotionally reactive to interpersonal stressors; we examine whether this pattern extrapolates to home-based stressors, work stressors, and stressors stemming from one's social network.

Age differences in physical reactivity to specific daily stressor domains remain unexplored. Some research suggests that specific stressors (i.e., occupational or work-related stressors) occurring on a daily basis are associated with lower levels of physical well-being (e.g., Hahn, 2000; Repetti, 1993). Given that physical symptoms and illness are consistently found to increase with age (House et al., 1994; Rowe & Kahn, 1987), a consideration of the role of age is even more critical when the type of distress under investigation is physical distress (Ensel & Lin, 2000).

Stressor Domain: Interpersonal, Work, Home, and Network Stressors

Previous studies have examined commonly reported stressors such as interpersonal stressors (e.g., Birditt et al., 2005), work stressors (Grzywacz, Almeida, & McDonald, 2002; Hahn, 2000), home stressors (Almeida, Wethington, & Chandler, 1999; Serido, Almeida, & Wethington, 2004), and network stressors (e.g., Almeida et al., 2002; Zautra, Finch, Reich, & Guarnaccia, 1991). However, to our knowledge, only the study by Birditt and associates examined age differences in reactivity. We expand on this work by examining whether age-related decreases in reactivity to interpersonal stressors extend to other domains of stressors.

Age differences for interpersonal problems are particularly germane when one is examining minor stressors encountered in daily life, where the majority of daily stressors involve interpersonal conflicts (Almeida, 2005). Although older adults report fewer arguments than do younger adults (Birditt et al., 2005), interpersonal conflicts are detrimental to an individuals' psychological (Rook, 1984; Sherman, 2003) and physical (Kiecolt-Glaser, 1999) functioning, regardless of age. Despite the fact that interpersonal stressors are important to well-being, however, older adults are less emotionally reactive to them than younger and middle-aged adults are (Birditt et al.).

Work-related stressors are also an important domain because they are linked with increased health problems (e.g., Chandola, Brunner, & Marmot, 2006) and poorer emotional health (e.g., Pflanz & Sonnek, 2002). The importance of the work domain typically increases in midlife, especially for men (Clark-Plaskie & Lachman, 1999). Therefore, this domain is particularly important to examine from an adult life-span perspective because of the shift in saliency in work that often accompanies aging; that is, work stressors could be particularly detrimental for people in midlife.

Network stressors may reveal different age-related patterns in reactivity than other stressors. For example, under some social situations, older adults experience greater heart-rate reactivity than younger adults do (Uchino, Holt-Lunstad, Uno, & Flinders, 2001). In the present study we examine whether these age differences are similar for emotional and physical reactivity to daily network stressors. Home stressors are also important to consider because they have been linked with increased anxiety (Evans & Steptoe, 2002) and tension (Almeida et al., 1999). Almeida and Horn (2004) found that younger and middle-aged adults reported more demands in the home than did older adults. We extend this finding by examining whether reactivity to home stressors differed by age.

The Importance of Personal Control for Age Differences in Reactivity

Greater personal control is related to reduced reactivity to stressors in daily life (e.g., Ong et al., 2005). We examine whether potential age differences in emotional and physical reactivity to interpersonal, network, home, and work stressors depend on perceptions of personal control. As goals shift in different domains for younger, middle-aged, and older adults, beliefs regarding control can be salient for reactivity to stressors in valued domains. The two control beliefs that we include in the present study are mastery and constraint. Mastery is often described in terms of one's judgments about his or her ability to achieve a goal, whereas perceived constraint refers to the extent to which a person believes factors exist that interfere with her or his goal attainment (Lachman & Weaver, 1998b). Personal mastery is an important psychological resource that mitigates the effects of stress and strain (Pearlin & Schooler, 1978). When a person is faced with stressful situations, a strong sense of control has also been linked to low levels of self-reported perceived stress (Cameron, Armstrong-Stassen, Orr, & Loukas, 1991) and lower risk of depression (Yates, Tennstedt, & Chang, 1999). Higher levels of perceived control also buffered recently bereaved wives from anxiety when they were faced with daily stressors (Ong et al.).

We were interested in examining both mastery and constraint in the present study because they could be differentially important across the adult life span. For example, as younger adults are striving toward goals in their work lives, a sense of mastery may be particularly important. Because midlife represents a time where work status and expertise may be at its peak (Clark-Plaskie & Lachman, 1999) and differences in sense of control within the work domain exist between young and middle-aged adults as a function of progress along the career path at different stages in the life course (Heise, 1990), we examined whether control beliefs would be particularly important for middle-aged adults' well-being in response to work stressors. On the basis of prior research findings and socioemotional selectivity theory that younger adults who are invested in establishing interpersonal relationships more often employ active problem-solving strategies to their daily interpersonal problems than older adults do, we predicted that perceived control (both constraints and mastery) would have a stronger relationship with well-being (both emotional and physical) among younger adults than among older adults. For this reason, we are extending findings first reported by Birditt and colleagues (2005) to examine how control may influence these age differences. Lastly, we explore potential interactions between control and age for stressors pertaining to the home and to those from the social network, domains that are not related to one specific age group.

The Present Study

We examined reactivity to daily interpersonal, network, home, and work stressors for younger, middle-aged, and older adults. We also examined whether reactivity differed on two measures of perceived control: personal mastery and perceived constraints. The daily diary design allowed for the examination of emotions and symptoms of people of different ages and different levels of control when a stressor actually happened

(Almeida & Kessler, 1998; Larsen, 1987). We hypothesized that older age would be related to higher levels of daily emotional well-being and to reduced emotional reactivity to daily stressors. In addition, we hypothesized that higher levels of personal mastery and lower levels of constraints would each be related to higher levels of both daily emotional and physical well-being as well as reduced reactivity in response to daily stressors for people at all ages. We also suggested that the strength of control beliefs on reactivity to stressors would vary as a function of age, such that control beliefs would exert the strongest influence for age groups in which the stressor domain is particularly salient. For domains in which saliency may not be systematically related to age (e.g., home and network), we explored control belief differences in reactivity.

Methods

Sample and Procedure

Data for the analyses are from the National Study of Daily Experiences (NSDE). Respondents were 1,031 adults (562 women, 469 men), all of whom had previously participated in the Midlife in the United States Survey (MIDUS), a nationally representative telephone-mail survey of 3,032 people, aged 25–74 years, carried out in 1995–1996 under the auspices of the MacArthur Foundation Research Network on Successful Midlife Development (for descriptions of the MIDUS project, see Brim, Ryff, & Kessler, 2004; Keyes & Ryff, 1998; Lachman & Weaver, 1998a; Mroczek & Kolarz, 1998). We randomly selected respondents in the NSDE from the MIDUS sample, and they received $20 for their participation in the project. Over eight consecutive evenings, respondents completed short telephone interviews about their daily experiences. We planned data collection to span an entire year (March 1996 to March 1997), so we used 40 separate "flights" of interviews, with each flight representing the 8-day sequence of interviews from approximately 38 respondents. We staggered the initiation of flights across the day of the week to control for the possible confounding between day of the study and day of week. Of the 1,242 MIDUS respondents we attempted to contact, 1,031 agreed to participate, yielding a response rate of 83%. Respondents completed an average of 7 of the 8 interviews, resulting in a total of 7,229 daily interviews.

The NSDE subsample and the MIDUS sample had very similar distributions for gender, age, education, and race. The NSDE had slightly more women (54.5% vs 51.5% of the samples, respectively), was better educated (60.8% of the MIDUS sample had 13 years or more of education, vs 62.3% of the NSDE subsample), and had fewer minority respondents than the MIDUS. Of the participants in the NSDE, 90.3% were Caucasian, 5.9% were African American, and 3.8% were all other races; in the MIDUS, 87.8% were Caucasian, 6.8% were African American, and 4.4% were all other races. On average, respondents for the present analysis were 47 years old. We wanted to remain consistent with previous studies that have examined age differences in stressor exposure (Almeida & Horn, 2004) and reactivity (Birditt et al., 2005) for young, middle-aged, and older adults with the NSDE. In addition, we hypothesized that the effects of control would vary according to specific age groups, whether young, middle-aged, or old, in the life span. For these reasons, we divided individuals into the following three groups (based on age at the time of the initial MIDUS survey): young (25–39 years), middle-aged (40–59), and old (60–74).

Measures

Daily physical symptoms.—We assessed daily symptoms by using a shortened version of the symptoms checklist by Larsen and Kasimatis (1991). We omitted items that overlapped with the psychological distress scale (e.g., "the urge to cry"). The present scale assessed health symptoms in six categories: (a) headaches, backaches, and muscle soreness; (b) cough, sore throat, fever, chills, or other cold and flu symptoms; (c) nausea, poor appetite, or other stomach problems; (d) chest pain or dizziness; and (e) other physical symptoms or discomforts. Each day, respondents indicated how frequently they experienced each symptom over the past 24 hours on a 5-point scale that ranged from none of the time to all of the time. We computed summed scores across the six items for each day. This scale has been used effectively in previous studies (e.g., Almeida et al., 2002; Charles & Almeida, 2006; Grzywacz, Almeida, Neupert, & Ettner, 2004).

Daily psychological distress.—We measured daily psychological distress by using 10 items designed specifically for the MIDUS. This scale was developed from the following well-known and valid instruments: The Affect Balance Scale (Bradburn, 1969), the University of Michigan's Composite International Diagnostic Interview (Kessler et al., 1994), the Manifest Anxiety Scale (Taylor, 1953), and the Center for Epidemiological Studies–Depression scale (Radloff, 1977). Respondents were asked questions such as these: How much of the time today did you feel worthless; hopeless; nervous; restless or fidgety; that everything was an effort; and so sad that nothing could cheer you up? They rated their response on a 5-point scale ranging from none of the time to all of the time. We summed scores across the 10 items for each day. This scale has also demonstrated good reliability and validity in previous studies (Kessler et al., 2002; Mroczek & Kolarz, 1998).

Daily stressors.—We assessed daily stressors through the semi-structured Daily Inventory of Stressful Events (Almeida et al., 2002). The inventory consisted of a series of seven stem questions asking whether certain types of daily stressors (i.e., arguments, potential arguments, work stressors, home stressors, network stressors, discrimination stressors, and other stressors) had occurred in the past 24 hours. For each daily interview, individuals who responded affirmatively to the stem questions received a value of one for the relevant stressor domain. We assigned scores of zero to domains where no stressors were experienced on that day. The present study utilized four stressor domain variables: interpersonal stressors (whether an argument or potential argument occurred; 44% of all stressors reported), work stressors (whether anything happened at work that could be stressful; 18% of all stressors reported), home stressors (whether anything happened at home that could be stressful; 15% of all stressors reported), and network stressors (whether anything happened to a close friend or family member that turned out to be stressful for the respondent; 10% of all

stressors reported). Interpersonal, work, home, and network stressors represent 87% of all stressors reported. The remaining 13% of stressors included experiences of discrimination (1.2%) and those not falling under any specific category (11.8%).

Control beliefs.—Researchers assessed control belief variables in the MIDUS survey. These measures were developed from Pearlin and Schooler's (1978) mastery scale with five additional items specifically designed for the MIDUS (Lachman & Weaver, 1998b). Respondents rated on a 7-point scale (1 = strongly agree, 7 = strongly disagree) how strongly they agreed with each statement. For the mastery scale, respondents answered the following questions: (a) I can do just about anything I really set my mind to; (b) when I really want to do something, I usually find a way to succeed at it; (c) whether or not I am able to get what I want is in my own hands; and (d) what happens to me in the future depends mostly on me. Researchers coded responses so higher scores indicated greater personal mastery for each person ($\alpha = 0.70$). For the constraint scale, respondents answered the following questions: (a) there is really no way I can solve all the problems I have; (b) there is little I can to do change the important things in my life; (c) I often feel helpless in dealing with the problems in life; (d) other people determine most of what I can and cannot do; (e) what happens in my life is often beyond my control; (f) there are many things that interfere with what I want to do; (g) I have little control over the things that happen to me; and (h) I sometimes feel I am being pushed around in my life. Researchers coded responses so higher scores indicated greater perceived constraints for each person ($\alpha = 0$ .86). These measures have been used successfully as valid indicators of personal mastery and perceived constraint in several studies (e.g., Lachman & Firth, 2004; Lachman & Weaver, 1998a, 1998b), and they were associated with each other in the current study; $r(1,021) = -.44$, $p < .001$.

Covariates.—Because men and women tend to differ in their average mood (Almeida & Kessler, 1998) and physical symptom reports (Verbrugge, 1985), we controlled for gender in all analyses. We further controlled for socioeconomic status (using education as a proxy) because of the differential emotional and physical reactivity to daily stressors found previously in the literature (Grzywacz et al., 2004).

Analyses

We implemented multilevel modeling using SAS Proc Mixed to examine emotional and physical reactivity to daily stressors. In this framework, individual change or variability is represented by a two-level hierarchical model (Hawkins, Guo, Hill, Battin-Pearson, & Abbott, 2001). At Level 1, each person's variability is expressed as an individual regression equation that depends on a set of parameters (intercept and slope). These individual parameters become the outcome variables in a Level 2 model, where they may depend on some person-level characteristics.

Multilevel modeling is frequently used to model intraindividual variability (i.e., people's variability around their own average). This technique was useful in the current study because we examined interindividual differences (e.g., age and control belief differences) in intraindividual covariation (e.g., the within-person relationship between stressors and psychological distress). For example, to examine age and constraint differences in emotional reactivity to interpersonal stressors, we created dummy codes for middle-aged (40–59 years) and older (60–74 years) adults. We formulated the following model:

$$\text{Level 1}: \text{Distress}_{it} = \beta_{0it} + \beta_{1it}(\text{Interpersonal Stressor}) + r_{it}, \quad (1)$$

$$\begin{aligned}\text{Level 2}: \beta_{0i} = {} & \gamma_{00} + \gamma_{01}(\text{Gender}) + \gamma_{02}(\text{Education}) \\ & + \gamma_{03}(\text{Middle}) + \gamma_{04}(\text{Old}) + \gamma_{05}(\text{Constraint}) \\ & + \gamma_{06}(\text{Middle} \times \text{Constraint}) \\ & + \gamma_{07}(\text{Old} \times \text{Constraint}) + u_{0i}, \quad (2)\end{aligned}$$

$$\begin{aligned}\beta_{1i} = {} & \gamma_{10} + \gamma_{11}(\text{Middle}) + \gamma_{12}(\text{Old}) + \gamma_{13}(\text{Constraint}) \\ & + \gamma_{14}(\text{Middle} \times \text{Constraint}) \\ & + \gamma_{15}(\text{Old} \times \text{Constraint}) + u_{1i}. \quad (3)\end{aligned}$$

In Equation 1, the intercept (β_{0it}) is defined as the expected level of psychological distress for person i on days when no interpersonal stressors occurred (i.e., Interpersonal Stressor = 0). Slope β_{1it} is the expected change in psychological distress associated with days when interpersonal stressors occur. Error term r_{it} represents a unique effect associated with person i (i.e., fluctuation around the mean). Equation 2 includes gender and education as covariates and tests for age and constraint differences in the average level of psychological distress, with the intercept γ_{00} representing the average level of psychological distress for younger women (Gender = 0) with less than a high school degree (Education = 0) with average constraint levels (control belief variables were centered around their grand mean). Equation 3 tests for age and constraint differences in the within-person association between interpersonal stressor exposure and psychological distress, with intercept γ_{10} representing the average relationship between interpersonal stressors and psychological distress for younger adults. Interindividual fluctuations from the level and slope are represented by u_{0i} and u_{1i}, respectively.

Results

Descriptive Statistics

Table 1 presents means and standard deviations of the study variables for each age group. Although there were no age differences in levels of physical symptoms, younger adults reported higher levels of psychological distress than middle-aged and older adults did, and they reported higher levels of personal mastery than middle-aged adults did. In contrast, older adults had higher levels of perceived constraints than did younger adults. Across all participants, interpersonal stressors (21.44% of days) were the most frequently reported stressors, followed by work stressors (9.36% of days), home stressors (7.9% of days), and network stressors (5.52% of days). Younger adults reported more frequent work stressors than did older adults, and they also reported more frequent interpersonal and home stressors than did middle-aged and older adults. There were no age differences in the frequency of network stressors.

Table 1. Age Differences in Daily Study Variables Tested With Multilevel Models

Variable	Younger Adults *M* (*SD*)	Middle-Aged Adults *M* (*SD*)	Older Adults *M* (*SD*)	Middle vs Younger Coeff. (*SE*)	Older vs Younger Coeff. (*SE*)
Physical symptoms	1.82 (1.85)	1.63 (1.84)	1.56 (1.68)	−0.17 (.13)	−0.22 (.15)
Psychological distress	2.28 (3.27)	1.81 (3.17)	1.34 (1.96)	−0.42* (.20)	−0.87*** (.25)
Frequency of interpersonal stressors	0.44 (0.27)	0.22 (0.20)	0.17 (0.19)	0.78**	0.54***
Frequency of work stressors	0.12 (0.17)	0.11 (0.16)	0.03 (0.09)	0.90	0.20***
Frequency of home stressors	0.10 (0.14)	0.08 (0.13)	0.06 (0.11)	0.75*	0.60**
Frequency of network stressors	0.06 (0.11)	0.05 (0.10)	0.06 (0.10)	1.00	1.04
Mastery	5.94 (0.86)	5.75 (1.13)	5.77 (1.01)	−0.18* (.07)	−0.17 (.09)
Constraint	2.60 (1.12)	2.70 (1.27)	2.89 (1.41)	0.09 (.09)	0.26* (.11)

Notes: Odds ratios are presented for models testing age differences in stressors. Age differences in control belief variables were tested with regression.

Younger adults = 25–39 years ($n = 336$); middle-aged adults = 40–59 years ($n = 469$); older adults = 60–74 years ($n = 224$). *SD* = standard deviation; *SE* = standard error.

*$p < .05$, **$p < .01$, ***$p < .001$.

Multilevel Models

Results from fully unconditional models indicated that 54% of the variability in psychological distress was between people ($\tau_{00} = 7.22$, $z = 19.42$, $p < .001$), and 46% was within people ($\sigma^2 = 6.23$, $z = 55.35$, $p < .001$). In addition, 55% of the variability in physical symptoms was between people ($\tau_{00} = 2.84$, $z = 20.03$, $p < .001$) and 45% was within people ($\sigma^2 = 2.36$, $z = 55.60$, $p < .001$). These models indicated that there was sufficient variability in each outcome variable at each level, which is necessary for further analyses (Nezlek, 2001; Raudenbush & Bryk, 2002).

We conducted multilevel models to examine the hypotheses that (a) older age would be related to higher levels of daily emotional well-being and to reduced emotional reactivity to daily stressors; (b) higher levels of personal mastery and lower levels of constraints would each be related to higher levels of both daily emotional and physical well-being; (c) higher levels of personal mastery and lower levels of constraint would be related to reduced reactivity in response to stressors for people at all ages; and (d) perceived control (both constraint and mastery) would have a stronger relationship with emotional and physical reactivity to interpersonal stressors among younger adults than among older adults. Models examining the aforementioned questions are presented in Tables 2 through 5. Across all models, older adults reported less psychological distress than younger adults did (γ_{04}). People with higher levels of constraint reported more distress than did those with less constraint (see Tables 2 and 4, γ_{05}), and older adults were different from the younger adults in the relationship between constraint and distress (see Tables 2 and 4, γ_{07}). Across all models, women reported more physical health symptoms than men, but there were no gender differences in psychological distress. Education was negatively associated with physical health symptoms and psychological distress.

Reactivity to interpersonal stressors.—In the first model in Table 2, we examined age and constraint differences in emotional reactivity to interpersonal stressors. Findings indicate that both middle-aged (γ_{11}) and older (γ_{12}) adults were significantly less reactive than the young adults (γ_{10}), that people with higher levels of constraint were more reactive (γ_{13}), and that middle-aged (γ_{14}) and older (γ_{15}) adults were significantly different from younger adults in their constraint differences in reactivity. The age and constraint differences in emotional reactivity to interpersonal stressors are presented in Figure 1. This figure plots psychological distress on days when an interpersonal stressor occurred and days when there were no reported interpersonal stressors for individuals with high and low levels of constraints. The pattern indicates that younger adults with high levels of constraints were the most emotionally reactive to interpersonal stressors (i.e., highest level of distress on interpersonal stressor days). This model accounted for 38% of the between-person variability and 13% of the within-person variability in psychological distress, which are estimates of a pseudo-R^2 (Singer & Willett, 2003). (Note that we plotted all figures by conducting additional models for individuals who scored lower than 1 *SD* below the control belief mean, identified as low constraint and low mastery, and higher than 1 *SD* above the control belief mean, identified as high constraint and high mastery.)

The second model in Table 2 examined age and control belief differences in physical reactivity to interpersonal stressors.

Table 2. Unstandardized Estimates (and Standard Errors) of Reactivity to Daily Interpersonal Stressors

Variable	Psychological Distress	Physical Symptoms
Well-being level, β_0		
Intercept, γ_{00}	2.38 (.21)***	2.11 (.15)***
Gender, γ_{01}	0.00 (.14)	−0.26 (.10)*
Education, γ_{02}	−0.31 (.08)***	−0.16 (.06)**
Middle, γ_{03}	−0.26 (.17)	−0.13 (.13)
Old, γ_{04}	−0.76 (.21)**	−0.23 (.15)
Constraint, γ_{05}	0.70 (.12)***	0.33 (.09)***
Middle × Constraint, γ_{06}	−0.02 (.15)	0.03 (.11)
Old × Constraint, γ_{07}	−0.46 (.16)**	−0.18 (.12)
Reactivity slope, β_1		
Average young slope, γ_{10}	1.62 (.18)***	0.55 (.09)***
Middle, γ_{11}	−0.51 (.24)*	−0.17 (.12)
Old, γ_{12}	−0.63 (.32)*	−0.29 (.16)
Constraint, γ_{13}	0.89 (.17)***	0.31 (.09)***
Middle × Constraint, γ_{14}	−0.51 (.21)*	−0.31 (.11)**
Old × Constraint, γ_{15}	−0.54 (.26)*	−0.25 (.13)

Notes: Younger adults were the referent group; gender, women = 0, men = 1; education, 0 = less than high school, 1 = high school, 2 = some college, 3 = college degree.

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 3. Unstandardized Estimates (and Standard Errors) of Reactivity to Daily Work Stressors

Variable	Psychological Distress	Physical Symptoms
Well-being level, β_0		
Intercept, γ_{00}	3.07 (.23)***	2.31 (.15)***
Gender, γ_{01}	−0.03 (.16)	−0.26 (.10)*
Education, γ_{02}	−0.52 (.09)***	−0.24 (.06)***
Middle, γ_{03}	−0.38 (.20)	−0.15 (.13)
Old, γ_{04}	−0.89 (.24)***	−0.25 (.15)
Mastery, γ_{05}	−0.27 (.18)	−0.22 (.11)
Middle × Mastery, γ_{06}	−0.43 (.21)*	−0.10 (.13)
Old × Mastery, γ_{07}	−0.03 (.25)	−0.06 (.16)
Reactivity slope, β_1		
Average young slope, γ_{10}	1.33 (.23)***	0.78 (.14)***
Middle, γ_{11}	−0.34 (.30)	−0.43 (.18)*
Old, γ_{12}	−0.24 (.54)	−0.20 (.32)
Mastery, γ_{13}	−0.70 (.28)*	−0.56 (.17)***
Middle × Mastery, γ_{14}	0.59 (.34)	0.53 (.20)**
Old × Mastery, γ_{15}	0.17 (.51)	0.52 (.30)

Notes: Younger adults were the referent group; gender, women = 0, men = 1; education, 0 = less than high school, 1 = high school, 2 = some college, 3 = college degree.

*$p < .05$, **$p < .01$, ***$p < .001$.

People with higher levels of constraint reported more physical symptoms (γ_{05}), but there were no age differences in the average number of symptoms reported (γ_{03}, γ_{04}). The second section of the model indicates that people with higher levels of constraint were more physically reactive to interpersonal stressors (γ_{13}), and that middle-aged adults (γ_{14}) were different

Table 4. Unstandardized Estimates (and Standard Errors) of Reactivity to Daily Home Stressors

Variable	Psychological Distress and Mastery	Psychological Distress and Constraint
Well-being level, β_0		
Intercept, γ_{00}	3.10 (.23)***	2.92 (.22)***
Gender, γ_{01}	−0.02 (.16)	−0.04 (.15)
Education, γ_{02}	−0.51 (.09)***	−0.38 (.09)**
Middle, γ_{03}	−0.41 (.20)*	−0.44 (.19)*
Old, γ_{04}	−0.98 (.24)***	−1.04 (.23)***
Mastery, γ_{05}	−0.31 (.17)	
Middle × Mastery, γ_{06}	−0.33 (.21)	
Old × Mastery, γ_{07}	0.04 (.25)	
Constraint, γ_{05}		0.97 (.13)***
Middle × Constraint, γ_{06}		−0.22 (.16)
Old × Constraint, γ_{07}		−0.69 (.18)***
Reactivity slope, β_1		
Average young slope, γ_{10}	1.15 (.27)***	1.03 (.26)***
Middle, γ_{11}	−0.32 (.36)	−0.24 (.36)
Old, γ_{12}	−0.20 (.46)	−0.05 (.46)
Mastery, γ_{13}	−0.88 (.30)**	
Middle × Mastery, γ_{14}	0.50 (.36)	
Old × Mastery, γ_{15}	0.52 (.42)	
Constraint, γ_{13}		0.55 (.23)*
Middle × Constraint, γ_{14}		−0.13 (.29)
Old × Constraint, γ_{15}		−0.21 (.36)

Notes: Younger adults were the referent group; gender, women = 0, men = 1; education, 0 = less than high school, 1 = high school, 2 = some college, 3 = college degree.

*$p < .05$, **$p < .01$, ***$p < .001$.

Table 5. Unstandardized Estimates (and Standard Errors) of Reactivity to Daily Network Stressors

Variable	Psychological Distress	Physical Symptoms
Well-being level, β_0		
Intercept, γ_{00}	3.08 (.24)***	2.24 (.15)***
Gender, γ_{01}	−0.01 (.16)	−0.26 (.10)*
Education, γ_{02}	−0.48 (.09)***	−0.17 (.06)**
Middle, γ_{03}	−0.42 (.20)*	−0.19 (.13)
Old, γ_{04}	−1.02 (.24)***	−0.31 (.15)*
Mastery, γ_{05}	−0.37 (.18)*	
Middle × Mastery, γ_{06}	−0.28 (.21)	
Old × Mastery, γ_{07}	0.04 (.25)	
Constraint, γ_{05}		0.40 (.09)***
Middle × Constraint, γ_{06}		−0.02 (.11)
Old × Constraint, γ_{07}		−0.24 (.12)*
Reactivity slope, β_1		
Average young slope, γ_{10}	1.01 (.37)**	0.49 (.19)*
Middle, γ_{11}	−0.25 (.47)	−0.17 (.25)
Old, γ_{12}	0.33 (.55)	−0.33 (.29)
Mastery, γ_{13}	0.40 (.42)	
Middle × Mastery, γ_{14}	−0.95 (.48)*	
Old × Mastery, γ_{15}	−0.15 (.59)	
Constraint, γ_{13}		0.37 (.17)*
Middle × Constraint, γ_{14}		−0.41 (.21)*
Old × Constraint, γ_{15}		−0.21 (.23)

Notes: Younger adults were the referent group; gender, women = 0, men = 1; education, 0 = less than high school, 1 = high school, 2 = some college, 3 = college degree.

*$p < .05$, **$p < .01$, ***$p < .001$.

from younger adults in their constraint differences in reactivity, but older adults (γ_{15}) were not different from younger adults (see Figure 2). Figure 2 indicates that younger adults with high constraints were the most physically reactive to interpersonal stressors. This model accounted for 12% of the between-person variability and 4% of the within-person variability in physical symptoms.

We also examined whether there were differences in daily psychological distress and physical symptoms as a function of mastery. For both emotional and physical reactivity, there were no mastery differences in the responses to interpersonal stressors across the adult life span.

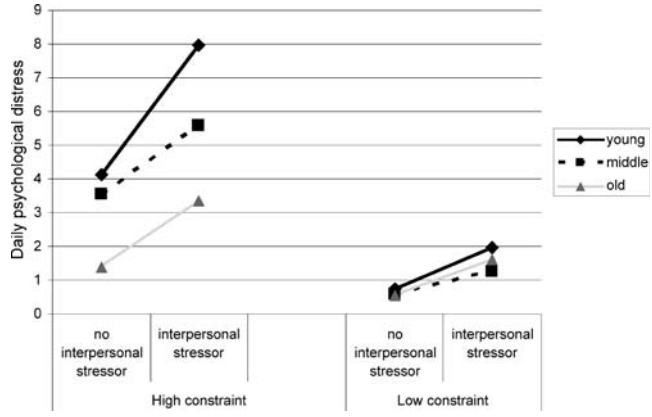

Figure 1. Age and constraint differences in emotional reactivity to interpersonal stressors, adjusted for gender and education.

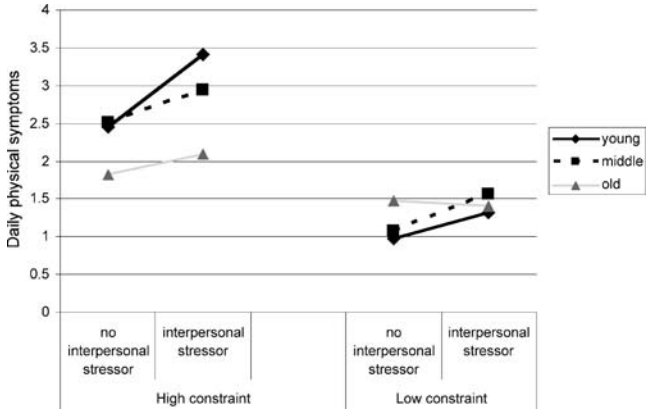

Figure 2. Age and constraint differences in physical reactivity to interpersonal stressors, adjusted for gender and education.

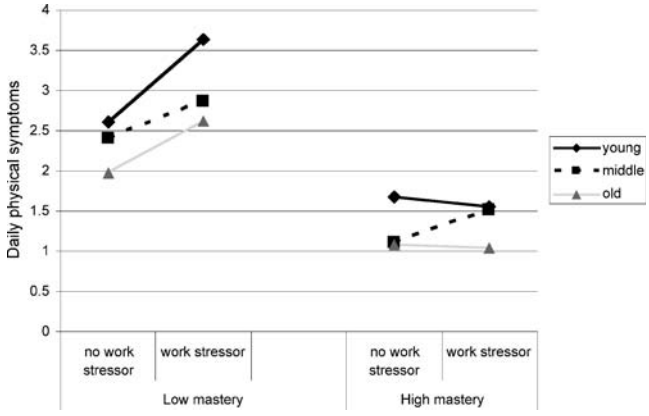

Figure 3. Age and mastery differences in physical reactivity to work stressors, adjusted for gender and education.

Reactivity to work stressors.—We examined the hypothesis that control beliefs would be especially important for middle-aged adults' reactivity to work stressors in Table 3. The first model in Table 3 indicates that older adults reported less distress than did younger adults (γ_{04}), younger adults' distress was more closely tied to mastery compared with that of middle-aged adults (γ_{06}), and people with higher mastery were less emotionally reactive to work stressors than were those individuals with less mastery (γ_{13}). There were no age and mastery differences in emotional reactivity to work stressors, suggesting that high mastery was equally beneficial for emotional reactivity to work stressors for all age groups. This model accounted for 11% of the between-person variability and 5% of the within-person variability in psychological distress.

The second model in Table 3 examined age and control belief differences in physical reactivity to work stressors. People with lower levels of mastery reported more physical symptoms (γ_{05}), but there were no age differences in the average number of symptoms reported ($\gamma_{03,}$ γ_{04}). The second section of the model indicates that people with lower levels of mastery were more physically reactive to work stressors (γ_{13}), middle-aged adults were less reactive to work stressors than were younger adults (γ_{11}), and that middle-aged adults (γ_{14}) were different from younger adults in their mastery differences in reactivity (see Figure 3). Figure 3 indicates that on days when respondents experienced work stressors, mastery buffered physical reactivity to work stressors for younger and older but not for middle-aged respondents. This model accounted for 5% of the between-person variability and 3% of the within-person variability in physical symptoms.

We also examined whether there were differences in psychological distress and physical symptoms as a function of constraint. For both emotional and physical reactivity, there were no constraint differences in the responses to work stressors across the adult life span.

Reactivity to home stressors.—Models conducted to examine age and control differences in reactivity to home stressors indicated that higher levels of mastery (γ_{13}) and lower levels of constraint (γ_{13}) were each associated with lessened emotional reactivity (see Table 4). These findings did not differ by age. Neither mastery nor constraint was associated with physical reactivity to home stressors, and there were no age differences in those associations.

Reactivity to network stressors.—Models conducted to test for age and control belief differences in reactivity to network stressors are presented in Table 5. High mastery was more beneficial for middle-aged adults' than younger adults' emotional reactivity (γ_{14}), but older adults' reactivity appears to remain heightened even with high levels of mastery (nonsignificant γ_{15} indicates similar slope to younger adults; see Table 5 and Figure 4). This model accounted for 10% of the between-person and 6% of the within-person variability in psychological distress. There were no age and constraint differences in emotional reactivity, and there were no age or mastery differences in physical reactivity. When examining the role of constraint for physical reactivity to network stressors, we found that a high level of constraint was associated with increased reactivity (γ_{13}). Similar to the pattern exhibited in Figure 4, this finding was further qualified by age where lower levels of constraint were more beneficial for middle-aged

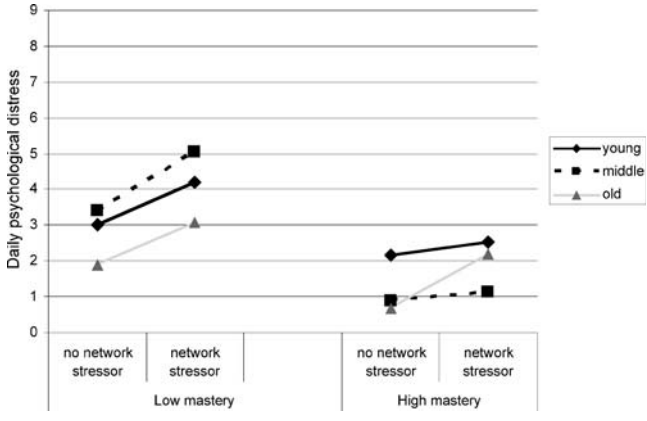

Figure 4. Age and mastery differences in emotional reactivity to network stressors, adjusted for gender and education.

adults' physical reactivity than younger adults' (γ_{14}), and younger adults with high levels of constraint exhibited the most reactivity. This model accounted for 8% of the between-person and 2% of the within-person variability in psychological distress. In sum, these models indicate that control in midlife is important for buffered reactivity to network stressors.

Discussion

The current study examined age and control belief differences in reactivity to daily stressors at three different stages in the adult life span. We incorporated the four most common domains of daily stressors and examined whether there were age differences in reactivity. By including stressors that may be differentially salient across the life span (e.g., work stressors in midlife), we also examined whether age differences in reactivity to these stressors depended on perceptions of control. We added gender and education as covariates in the models. The education differences in both indicators of well-being as well as the gender differences in physical health supported previous work (e.g., Grzywacz et al., 2004; Verbrugge, 1985).

Age differences in reactivity.—As we predicted, middle-aged and older adults evidenced a smaller increase in psychological distress in response to interpersonal stressors than did younger adults, and middle-aged adults were less physically reactive to work stressors than were younger adults. These age patterns are consistent with many studies in which older age is related to reduced stressor reactivity (Birditt et al., 2005), reduced duration of negative emotions (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000), and increased well-being (Charles, Carstensen, & McFall, 2001; Mroczek & Kolarz, 1998). Preserved and even enhanced emotion regulation with age is consistent with socioemotional selectivity theory (Carstensen, 1995; Carstensen, Fung, & Charles, 2003; Carstensen et al., 1999), which posits that emotional goals become increasingly important as people grow older, so resources could be directed at buffering the negative emotional effects of stressors. Enhanced emotion regulation could also be due to learning through an accumulation of experiences, as well pursuing valued outcomes (Deci & Ryan, 2000). In the present study, we were interested to see if the emotion-regulation findings of Birditt and colleagues and socioemotional selectivity theory could be applied to stressors outside of the social domain. Our findings suggest that there are no age differences in emotional or physical reactivity to home or network stressors. Although home and network stressors were both associated with an increase in psychological distress and physical symptoms, this increase was consistent across the adult life span. It is important to note, however, that these domain-specific age differences in reactivity for interpersonal, network, and work stressors were further qualified by control beliefs.

Age, perceived constraints, and reactivity to interpersonal and network stressors.—Consistent with previous work (Cameron et al., 1991, Ong et al., 2005), control beliefs were important for mitigating the negative effects of interpersonal stressors. Although high levels of perceived constraints were related to worse outcomes for people of all ages, this relationship was stronger among younger adults than among middle-aged and older adults. Younger adults who reported high levels of perceived constraints reacted most strongly to daily interpersonal stressors, reporting more psychological distress and more physical symptoms on these days compared with days when no interpersonal stressors occurred. Age differences in life circumstances and life goals may partially explain this finding. As suggested by socioemotional selectivity theory, establishing relationships is an important goal for younger adults, making this a salient area for stressors and important for reactivity when control is perceived as low. This theory also posits that older adults may be better at regulating their responses to interpersonal stressors even in the face of perceived constraints because of a focus on emotional goals and awareness of reduced time left in life. High constraint was detrimental for younger adults' physical symptoms when we examined network stressors, but it was detrimental for older adults' as well. Although network stressors are social in nature, they encompass events other than arguments and disagreements and may be particularly vulnerable to constraints for older adults, who may experience more uncontrollable kinds of stressors in their social networks (e.g., health-related stressors; see Almeida et al., 2002). This finding also highlights the suggestion by Ensel and Lin (2000) for researchers to examine physical distress in addition to psychological distress, as the patterns of reactivity are different.

Age, personal mastery, and reactivity to work and network stressors.—High levels of personal mastery were associated with reduced emotional and physical reactivity to work stressors, but this relationship did not appear to hold for middle-aged adults' physical reactivity; that is, middle-aged adults exhibited heightened physical reactivity to work stressors regardless of their level of mastery. This finding supports previous research suggesting that the importance of the work domain typically increases in midlife (Clark-Plaskie & Lachman, 1999). Because of the increased salience of work during midlife, it is possible that stressors in this domain are particularly threatening to middle-aged adults and that they experience increased physical symptoms even if, as previous research suggests (e.g., Heise, 1990), they report more control over work than do younger adults. A high sense of global mastery does not appear to be enough to counteract the negative primary appraisal of work stressors. Primary appraising (e.g., Lazarus, 1999) involves the relevance of what is happening to one's values, goal commitments, and beliefs about self and world; whether an individual experiences distress as a result of a stressor depends upon the appraisal of the situation. Previous work suggests that work-specific control beliefs are important for well-being (Elfering et al., 2005), but future research able to map work-stressor-specific control beliefs could directly test if certain aspects of control may be differentially important for middle-aged adults' reactivity to work stressors.

High mastery was more beneficial for middle-aged adults' emotional reactivity to network stressors than for younger or middle-aged adults'. Because mastery can involve problem-focused solutions and active goal striving (Lachman & Firth, 2004; Lachman & Weaver, 1998b), it is possible that middle-aged adults may be called upon to assist with the stressors in their social networks. For example, middle-aged adults may provide care and support for aging parents and young children

and need to solve problems stemming from both social roles (e.g., Schlesinger, 1989), in which case a sense of mastery that one can solve problems would be extremely beneficial to combating the stressors. A high sense of control was not beneficial for older adults' reactivity to network stressors, so future research able to examine the specific sources of network stressors and the age differences associated with them could address whether the context, sense of control, or age of the person is more important for reactivity. Future work incorporating measures of positive affect could examine whether the patterns of emotional reactivity depend on valence. Additionally, examining the perceived threat and severity of the stressors could be an important step for future work, as Almeida and Horn (2004) found some age differences in stressor threat dimensions (danger and frustration) and subjective severity ratings.

Conclusions

We found that middle-aged and older adults were less physically and emotionally reactive to interpersonal stressors, and, before we considered the role of perceived control, middle-aged adults were less physically reactive to work stressors. We also documented the salutary effects of low perceived constraints and high personal mastery in buffering the emotional and physical repercussions of daily interpersonal, network, and work stressors. We further found that these influences vary by age, such that low perceived control was more detrimental for younger adults than it was for middle-aged or older adults in the context of daily interpersonal stressors. With respect to daily work stressors, low levels of mastery were detrimental for all age groups, but adults in midlife were physically reactive even when they reported high levels of mastery. Constraint was associated with increased physical reactivity to network stressors for all ages, but it exacerbated the reactivity of younger and older adults in particular. Furthermore, younger and older adults with low mastery exhibited increased emotional reactivity to network stressors. We interpret these findings as reflecting differences in life circumstances with age and also stressor domain.

Acknowledgments

Support for this research was provided by a MIDUS pilot grant from the National Institute on Aging (NIA) under Grant PO1 AG20166 awarded to Shevaun D. Neupert; the MacArthur Foundation Research Network on Successful Midlife Development, under NIA Grant AG19239 awarded to David M. Almeida; and NIA Grant R01 AG023845 awarded to Susan Turk Charles.

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Received December 7, 2005
Accepted February 27, 2007
Decision Editor: Karen Hooker, PhD