Dealing with negative life events: differential effects of personal resources, coping strategies, and control beliefs

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Abstract The study examines the extent to which resources, coping strategies, and control beliefs predict adaptation to negative critical life events. Specifically, we investigated the effects of basic resources (i.e., sociodemographics, cognition, health, social), coping (i.e., assimilative and accommodative coping), and control beliefs (i.e., internal control) as well as their interplay in the context of multiple negative events. Well-being served as an indicator of adaptation. Four hundred and twenty middle-aged participants of the Interdisciplinary Longitudinal Study of Adult Development (ILSE; Schmitt 2006) were assessed at two measurement occasions 4 years apart. Events and coping were assessed via interviews (e.g., assimilative coping: active problem-solving, goal-directed effort, social support; accommodative coping: reevaluation of situation, acceptance, and adjustment of standards). Participants experienced an average of six negative events between measurement occasions. Resources had positive relations to control beliefs, coping, and well-being. More resources were related to fewer negative events experienced later on. More negative events were linked to more coping and poorer well-being. Structural equation models showed that the effect of resources on well-being was mediated by assimilative coping. Subgroup analysis revealed that the beneficial effect of assimilation was restricted to individuals with high internal control beliefs. Although the

relationship between events and coping did not differ between both groups, only individuals with high control beliefs benefited from assimilation, perhaps because they coped more effectively. In sum, investigating resources, coping, and control beliefs concurrently allows the identification of more complex effect patterns that enhance the understanding of individual differences in dealing with negative life events.

Keywords Critical life events · Resources · Coping strategies · Control beliefs · Midlife

Introduction

Although research on life events spans several decades (Holmes and Rahe 1967; Zautra and Reich 1983), there are still many open questions regarding how individuals deal with negative critical life events. To date, consistent evidence speaks against a fast, habituation-like recovery after events, as suggested by the hedonic treadmill model (e.g., Brickman and Campbell 1971). Instead, Diener et al. (2006) showed that well-being is likely to remain reduced for an expanded period of time: after events such as the death of a spouse, unemployment, divorce, or onset of disability, there was no recovery for years. Researchers also observed substantial differences among individuals in the extent of recovery, further challenging the idea of an automatic process. Factors which are responsible for these interindividual differences still require further investigation.

Research of difficult life situations and of adaptation mechanisms has been dominated by two classic traditions. The first one focuses on critical life events, following the approach introduced by Holmes and Rahe (1967). This approach is guided by the idea that events differ in their

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impact with some events being more disruptive than others (e.g., death of a spouse being the most difficult to deal with) and that although some people fare better than others, events have a somewhat universal effect (i.e., individuals should be affected by losing their spouse). This tradition also takes into account that critical life events rarely happen in isolation; they are often followed by other events (e.g., Norris and Kaniasty 1996). For example, losing one's job is likely to be followed by financial difficulties, losing property, shrinkage of social network following degradation of social status, destabilization of partnership or divorce, and stress-related health issues. Recognizing that accumulation of critical events represents the norm rather than an exception, a substantial number of studies have investigated stress associated with multiple life events (e.g., Headey and Wearing 1989; Holahan et al. 1999; Suh et al. 1996; Zautra and Reich 1983). Being primarily concerned with impact and consequences of the events, this research tradition was less interested in the ways in which individuals dealt with the events.

The second classic research tradition focuses on mechanisms of coping. These studies usually restrict their investigation to single events, such as being confronted with a life-threatening health condition, and investigate individual differences in coping, such as the frequency of problem-oriented or emotion-focused coping, and the benefit related to their use (Lazarus 1966, 1993; Lazarus and Folkman 1984). Research following this tradition has examined less systematically what may determine coping with multiple events (Filipp 1995). For instance, when feeling overwhelmed by many events, individuals may be more likely to deal with their emotions rather than actively address their problems. Individuals' reaction to critical events may also depend on their position at the life-span, which comes with different roles or restrictions (see Boerner and Jopp 2007 for an overview). A taxonomy that addresses developmental shifts in coping tendencies is the dual-process model by Brandstädter (1999, 2006), proposing assimilative and accommodative strategies as central components. Similar to problem-focused coping, assimilative strategies include problem analysis, seeking support, and active problem-solving. Emotion-focused coping has some overlap with accommodative strategies as they include reappraisal, distancing from the situation, and seeking comfort. Both coping modes can lead to positive adaptation, depending on the fit between individual characteristics and situational demand (Boerner 2004; Brandstädter and Renner 1990). Although individuals differ in their preferences for both coping modes, assimilative strategies are assumed to be more salient in younger ages, whereas accommodation strategies become more important with advancing age (Brandstädter 1999, 2006). Possible explanations are that older adults are more likely to encounter irreversible losses (e.g., death of a spouse) and that the resources they may need to deal with critical events become increasingly scarce.

These classic approaches can be complemented by two additional perspectives, namely the resource perspective and work on control beliefs. Whereas studies on events and coping often neglect individual differences in basic prerequisites of the person (e.g., education) and his/her environment (e.g., social network), resource approaches such as Hobfoll's (1989) conservation of resource theory emphasize the importance of individuals' overall resources. Higher levels of resources were found to be related to higher subjective well-being (Diener and Fujita 1995; Jopp and Smith 2006), whereas resource loss was predictive of depression (Hobfoll et al. 2003; Holahan et al. 1999; Wells et al. 1997), further supporting that resources are critical for adaptation.

Although it is likely that coping strategies operate on the basis of resources, only limited attempts have been made to integrate both approaches (e.g., Filipp 1995; Moos and Holahan 2003). The few studies combining both perspectives, however, suggest that adaptation to negative events is positively influenced by resources as well as coping strategies, and that their interplay may affect how successfully stress is dealt with. For instance, Holahan and Moos (1991) showed that in high-stress situations, resources including self-confidence and family support predicted the use of active problem-focused coping which, in turn, was associated with lower depression. Other work not related to critical events demonstrated that when individuals lack resources, coping or life-management strategies can buffer the effect of restricted resources (Jopp and Smith 2006; Staudinger and Fleeson 1996).

Control beliefs may also be critical for dealing with negative events. As feeling in control is related to higher well-being and longer survival (Krause and Shaw 2000; Lachman and Weaver 1998; Ruthig et al. 2007), one could assume that control beliefs also play a role in handling everyday difficulties and critical events. Nevertheless, control beliefs and coping are seldom investigated together. Conceptually, control and coping have little overlap, although strategies can be seen as a means to optimize an individual's potential to control the environment, as proposed by Heckhausen and Schulz (1995). However, the life-span theory of control does not address the relation between strategies and control beliefs.

Rothermund and Brandstädter (2003) investigated control beliefs and coping concurrently and found that both changes in internal control beliefs and assimilative and accommodative coping were related to changes in depression. Although there have been claims that individuals with strong beliefs about their competence should be better able to cope with difficult situations (e.g., Bandura 1997), the interactive effect between control and coping has rarely been studied. As control beliefs can be assumed to be linked to action-relevant motivation in that high internal control beliefs should trigger approach rather than avoidance,

individuals with higher internal control might be more likely to use assimilative strategies, actively reacting to the negative event by problem-solving. Control beliefs may also help individuals to use coping strategies more efficiently, as they are convinced of their competence. If individuals believe that they are in charge, then they may be more likely to successfully change their situation by applying the assimilative strategies effectively.

Thus, examining resources, control beliefs, and coping in concert seems relevant to explain individual differences in adaptation to multiple negative life events, and the present study seeks to further investigate their functional dynamic. Acknowledging that critical events often trigger other events, we examined adaptation to multiple negative events, complementing research on single events. As determining adaptation success requires controlling for levels of functioning prior to the events, we chose a prospective study design.

We focused on middle-aged men and women who represent a very interesting group given their position in the life course. First, individuals at midlife are likely to experience several critical life events including parental bereavement (Lachman 2004), death of spouse (Aldwin and Levenson 2001), onset of chronic health conditions (Spiro 2001), and change in work roles (Kim and Moen 2002). Second, critical events are expected to be especially disruptive in midlife because it represents a challenging life phase with high demands and multiple social roles (e.g., care for children and parents, partnership, work) (Boerner and Wang 2010). Third, midlife also is a time of peak functioning and high resources (Lachman 2004), increased self-management strategies (Freund and Baltes 2002) and superior emotion regulation (Magai and Halpern 2001). Thus, middle-aged individuals may be more vulnerable for events and their disruptive effects, but may also be best equipped to handle them.

Integrating the resource and the coping perspective on stress, we assumed that resources and coping strategies were beneficial for dealing with the events. As individuals are likely to be confronted with different adaptation tasks when handling multiple events, we used a broad resource composite (i.e., sociodemographic, cognitive, health, and social) and a comprehensive measure of coping strategies (i.e., assimilative and accommodative strategies). Analogous to Moos and Holahan (2003), we considered resources as prerequisites and a functional basis on which individuals operate. Because resources can enable or facilitate adaptation efforts (Hobfoll et al. 2003), we further hypothesized that resources are linked to coping strategies. In line with dual-process theory, assimilative strategies were assumed to be positively related to resources, because problem-oriented coping aimed at changing the world according to one's needs requires action means. Accommodative strategies such as changing one's view or standards should depend less on resources. Accommodation was instead assumed to be triggered more

strongly by the number of events. Since accumulation of events might limit the coping capacity, accepting the situation rather than fighting it might become more likely.

Although some authors consider control beliefs as part of resources (e.g., Bisschop et al. 2004), we argue that control beliefs should be kept separate as both constructs differ in terms of nature as well as function. In our conceptualization, resources represent basic characteristics of the person such as health or social network. According to action theory, resources can be considered as action means (i.e., that can be used to reach a goal or that represents factual prerequisites). Control beliefs, in contrast, are part of what we refer to as psychological strengths (Jopp et al. in press). They are mental schemas and have a special role as they motivate actions, for example, by initiating or hindering the use of specific strategies. Thus, we expected that internal control beliefs would influence the coping response triggered by the events: individuals feeling in control were assumed to use assimilation more frequently and individuals with low control beliefs should benefit more from using accommodation. As beliefs are further responsible for how well these actions are carried out, individuals with high control beliefs were assumed to use the strategies more effectively. Thus, assimilative coping strategies should be more strongly related to positive adaptation in individuals with strong control beliefs.

In summary, the current study had three goals: (a) to investigate the amount of negative critical life events in midlife, (b) to examine the role of resources, coping strategies, and control beliefs in dealing with multiple events, and (c) to specifically address the interplay of resources, strategies, and beliefs for adapting to the events. (Due to space limitation, we will use the shorter term 'negative events' or 'events' as a synonym for 'negative critical life events' from now on.)

Methods

Sample

The data originate from the first two waves of the Interdisciplinary Longitudinal Study of Adult Development (ILSE; see Schmitt 2006). Sample development followed a stepwise procedure. From 4,800 community-dwelling individuals with German citizenship identified by local registries in two metropolitan (i.e., about 500,000 inhabitants) regions in West (Heidelberg–Mannheim–Ludwigshafen) and East Germany (Leipzig), a group of 2,500 individuals were randomly drawn. Individuals of this group were contacted by mail, and an initial phone interview was conducted until a sample was obtained that satisfied the study's stratification criteria (birth cohort, gender, and region). The final sample contained 500 participants born between 1930

and 1932, and 501 participants born between 1950 and 1952 (half from Heidelberg and half from the Leipzig region). In order to compensate for longitudinal sample mortality, men were oversampled (52%). Data were collected between 1993 and 1996 (T1) and between 1997 and 2000 (T2; $\Delta T1-T2$: 4.1 years). Besides slightly higher educational status and income, the sample is largely representative of these age segments of the population of German citizens (see Rudinger and Minnemann 1997 for more details). Being interested in middle-aged individuals, we selected the cohorts born between 1950 and 1952 for the present study. For the follow-up at T2, 449 of the 500 initial participants were assessed. Comparing drop-outs with the remaining group at T2 revealed no differences concerning education, income, health, depression, and crystallized intelligence.

After excluding 12 individuals who did not experience any critical events and 17 multivariate outliers (Tabachnik

and Fidell 1989), the final sample consisted of $N = 420$ individuals. Sample characteristics are presented in Table 1.

Measures

After having given informed consent, the participants completed a comprehensive assessment, including a semi-structured interview concerning their actual life situation, a medical examination, cognitive tests, sociodemographic and personality questionnaires, and a psychiatric screening. Measures relevant for this study are described below.

Resources

Sociodemographic, cognitive, health, and social resources were measured at T1. As *sociodemographic resources*, we used graduation level (0 = no graduation to 5 = university

Table 1 Sample descriptives and resource variables (T1; $N = 420$)

Variable name	Mean (or %)	Standard deviation
Age (T1; in years)	44.20	0.90
Gender		
Men	52.6%	
Women	47.4%	
Marital status		
Married	73.0%	
Divorced	16.7%	
Widowed	0.5%	
Single	9.8%	
Years of education	14.14	2.43
Education level		
No graduation	0.7%	
Elementary school	27.6%	
Secondary school level	39.8%	
Polytechnical school	2.6%	
Specific college of higher education	5.2%	
University degree	24%	
Income		
>2046€	53.9%	
Between 1023€ and 2046€	35.1%	
<1023€	11.0%	
Immediate word recall	6.25	1.53
Immediate picture recall	5.82	0.91
Delayed word recall	8.13	2.08
Physician's health rating (recoded: 1 = very bad, 6 = very good)	4.74	0.76
Number of medication	11.10	1.47
Subjective health (recoded: 1 = very poor, 6 = very good)	4.57	0.78
Health impairment (1 = no, 0 = yes)	0.67	0.47
Close friend available (1 = not at all, 5 = strongly)	3.20	1.51
Time spent with children (0 = no time, 9 = every day)	6.81	3.07
Time spent with close friends (0 = no time, 9 = every day)	4.36	2.89

degree) and years of education (i.e., school and vocational training). Participants also indicated their monthly net income per household on a scale with three categories (1 = less than 1023€, 2 = between 1024 and 2046€, 3 = more than 2046€). *Cognitive resources* were measured with three memory tests from the Nuremberg Ageing Inventory (Oswald and Fleischmann 1993). These were two immediate recall tests, one used a list of 12 words, the other used 7 pictures, and a delayed recognition test in which the 12 words of the immediate recall test were presented 30 min after its initial administration together with 12 distractors. The number of correctly identified (recalled or recognized) targets in each test was used as performance indicator. *Health resources* were assessed using two objective and two self-report measures. As objective health indicators, a physician's professional health evaluation and the number of medications taken by the participants were used. The professional health evaluation was based on pre-defined criteria concerning anamnesis, clinical status, functional diagnosis, and laboratory parameters (ranging from 1 = very good health to 6 = very bad health). For example, the physician gave the rating *good health* (i.e., the score 2) if the participant had one or more of the following rather mild conditions: (a) one severe illness that they had overcome or up to three mild illnesses without impairments of everyday life; (b) if participants had recurring pain, but no subjective impairments and no medication intake; (c) if the examination findings showed some small deviance from the norm (i.e., blood pressure > 140/90) or one severe deviance (i.e., blood pressure > 200/100); and (d) if there were some less severe or one severe deviance (i.e., blood glucose > 400 or cholesterol > 200). As second objective indicator, number of medication was determined based on a list of their medications that participants were asked to bring with them to the interview. Reported number of medication ranged from 0 to 12. Subjective health indicators included the participants' rating of their health (1 = very good to 6 = very poor), and perceived health impairment in everyday life (1 = no, 0 = yes). *Social resources* were measured whether participants felt that they had close friends (1 = not at all, 5 = strongly) and the frequency of contact to children (mean score of time spent with child 1 to 3) and to close friends (each variable ranging from 0 = no time spent to 9 = everyday).

If necessary, items were recoded so that higher values referred to higher status (e.g., of health). We constructed unit-weighted composites for each resource domain (i.e., sociodemographic, cognition, health, and social resources). Analogous to earlier research (Diener and Fujita 1995; Hobfoll 1989), we also computed a composite indicator to represent the overall resource status (i.e., mean of all z-standardized specific resource indicators). Internal reliability (i.e., Cronbach's alpha) was acceptable ($\alpha = 0.67$).

Internal control

Control beliefs were measured at T1 with a 3-item scale on internal control developed for the Berlin Aging Study (Kunzmann et al. 2002). Items included statements about having control over good things in life, being able to make things happen, or obtaining desired things by working hard for them (1 = applies not at all to 5 = very much; $\alpha = 0.61$).

Critical negative life events

Life events were measured for the time period between T1 and T2. In a semi-structured interview, participants were asked at T2 about any events in the preceding 4 years and to specify the year of their occurrence. If the valence or the timing of an event was not clear, participants were asked for clarification. Later in the interview, participants were also asked about changes in more specific domains, including job, health, housing/living, socioeconomic situation, and family and other social contacts. Development of the coding schema was oriented upon the Structured Life Events Inventory (SLI) by Wethington (1997). The SLI includes 90 events and difficulties, which are characterized by a high likelihood for severe consequences and for being understood as a threat. Following the SLI when coding our data, we ensured that only those situations were classified as events that indeed represented critical life events for a majority of individuals (rather than daily hassles). The negative life events reported in our sample were classified into 34 categories which referred to issues in the context of work (e.g., loss of job, serious issues with colleagues, retirement), health (e.g., serious health problems, operation), residence/housing (e.g., serious problems with neighbors, housing situation), finances (e.g., having debts), justice (e.g., involved in lawsuit), partnership (e.g., serious problems with spouse/partner, divorce, death of spouse/partner), social relations (e.g., death of parent, serious issues with children or friends), and further events (e.g., victim of criminal act, house burned down; Voss et al. 2006; see Voss 2007 for more details). Events were coded by three trained psychologists from the research team. Inter-rater reliability was acceptable (Cohen's $\kappa = 0.80$). Sum scores for each year and for the total number of events were built. Given the focus on the effects of acute events, continuous or chronic stressors were not included (e.g., disability).

Coping strategies

Along with the questions regarding negative events assessed at T2, participants were also asked how they reacted to the events they had indicated in the domains of job,

housing, health, marriage, and children. The classification system by Thomae (1987, 1996) was used to categorize their responses. We focused on the 14 categories that specified coping strategies. Those categories of Thomae's system that represented outcomes rather than strategies were not used (e.g., depression, aggression, anxiety, psychosomatic reaction). Since participants varied largely with respect to how often they used a specific coping strategy, a categorical variable was built to reflect the endorsement, ranging from 0 (never) to 4 (very frequently). Endorsement of a specific coping strategy was then combined across the five domains (i.e., job, housing, health, marriage, and children; see Sperling 2003 for more details).

In order to discriminate assimilative and accommodative coping responses, strategies were sorted based on the definition by Brandtstädter (2006) and Brandtstädter and Renner (1990). Assimilative coping strategies included goal-directed effort, problem reflection/cognitive evaluation, productive behavior, using institutional options, making use of opportunities, asking others for help, and establishing/nurturing social relations. Accommodative coping strategies included adjustment to needs/habits of others, delay of gratification, relying on others, adjustment of standards/expectancies, accepting situation, and positive reevaluation (Table 2). Internal consistency was acceptable to good (Cronbach's α : assimilation: 0.63; accommodation: 0.63; total coping: 0.73).

Subjective well-being

Serving as an indicator of adaptation, well-being was measured at T1 and T2 with the Philadelphia Geriatric Center Morale Scale (PGCMS; Lawton 1975; Cronbach's α : total: 0.81, 0.83). Items were answered with 1 = yes or 0 = no. The subscales life satisfaction, aging satisfaction, and non-agitation were represented by the means of their items. The mean of the subscales was used to represent overall well-being. Higher scores indicated higher well-being.

Missing replacement and analytic procedure

As only a few data points were missing (number of missing per item ranged between 1.3 and 4.5%), we used regression procedures in SPSS to estimate these values (e.g., if one item of the aging satisfaction scale was missing, the other items of the scale, age, and gender were used to predict the missing value). Analysis first addressed the frequency of negative life events (i.e., year 1–4) and their relationship to each other to examine potential memory bias. We then conducted Pearson correlations to link resources, events, coping, control beliefs, and well-being in order to describe their zero-order relation. A series of structural equation

models (SEM) then examined the concurrent relations between the constructs. Besides other methodological advances (e.g., correction for measurement error), SEM was applied because it allows a comprehensive description of complex structures of relations and to show how these patterns of relations change when taking a third factor (e.g., moderator) into account. Particularly, the first SEM tested coping as an overall construct in relation to resources, events, and well-being, in order to allow the comparison to prior studies using a broader coping approach. The second SEM examined the differential effects of assimilative and accommodative coping strategies. The third SEM tested the role of control beliefs as a moderator by using a two-group model separating individuals with high and low control beliefs. In order to examine which paths differed significantly across the two groups, nested models were compared with respect to their model fit as proposed by Byrne (2004). As baseline for this comparison, we used a model in which all paths were set to equal across low and high control groups (loadings, covariance, and error variances which had been found not to vary across groups were also set to equal). Then, single paths were set free and the resulting change in model fit was compared to the baseline model. The paths were considered as statistically different across groups if the change in model fit was significant.

Results

Descriptive and correlational analyses of negative life events

The first set of analysis addressed the nature of the negative events. Participants reported up to 20 events, with an average of 5.9 negative life events. The most common negative events included serious health problems (indicated by $n = 247$, 58.8%), serious issues with children ($n = 215$, 51.2%), and change of occupational situation ($n = 176$, 41.9%).

Given claims regarding the lack of validity of event reports due to memory bias, we examined the number of events reported for each year. The average number of events experience per year varied between 1.38 (Year 1 after T1) and 1.68 (Year 3 after T1; Table 3). Only 10 participants were unable to indicate the exact timing of some events during T1 and T2. Paired t test with adjusted alpha level for multiple testing (i.e., $p = 0.01/6$ tests = 0.002) revealed no significant differences in terms of frequency across years, indicating that there was no systematic memory bias in terms of remembering events more or less close to the interview assessing them (e.g., Events Year 1 vs. Year 4: $t = -0.35$, $p = 0.73$, ns). Correlations between the events ranged between $r = 0.05$ (ns; Year 1 and 4) and 0.23

Table 2 Coping strategies indicated as responses to stress: category and number of individuals reporting strategies for each category, with definition and examples ($N = 420$)

Response to stress and indication (number of individuals, %) ^a	Definition	Example
Assimilative strategies		
Productive behavior ($n = 418$; 99.5%)	Producing, accomplishing project/goals in terms of production	“When I started my new job I had only a short period of vocational adjustment and I was responsible for human resource management and financial accounting. It was really too much—I had to fight for everything”
Establishing/nurturing social relations ($n = 384$; 91.4%)	Initiating and reinforcing social networks/social relations to solve problems and/or to relief or sustain severe stress	“Whenever I’m in trouble, I discuss my situation with my husband”
Using institutional options ($n = 381$; 90.7%)	Provision and/or utilization of factually essential information and capabilities concerning social conditions (chances and barriers) for problem-solving	“I have been suffering from migraines since I was 27 years old. ... Some years ago, it was as hard as never before. I went to see the a physician. He really helped me with acupuncture and I was painless for more than three years”
Problem-reflection/cognitive evaluation ($n = 250$; 59.5%)	Analyzing problems; activities of knowledge-acquisition and knowledge-enlargement	“After the problems we had in our firm I wondered about starting up my own business”
Goal-directed effort ($n = 202$; 48.1%)	Goal setting and investing effort to maintain the goal and to work toward the (distant) goal	“I was eager to travel around the world for at least one year. Thus, I did everything to reach this goal and to be well-prepared”
Asking others for help ($n = 68$; 16.2%)	Request for support addressed to individuals, institutions or to supernatural beings	“When I was in rehab I could not put on my stockings and shoes. I asked the nurse for help”
Making use of opportunities ($n = 41$; 9.8%)	Events or situations the individual is taking advantage of	“I was so in love with the sister of my best friend. I talked to him and he arranged a date with her for me”
Accommodative strategies		
Accepting situation ($n = 322$; 76.7%)	Accepting the situation as it is without resignation	“In general, I am very satisfied with my health (...). At one point, I accepted the fact that I have allergies. There is nothing I can do about it to get rid of them. So what—I am fine”
Adjustment to needs/habits of others ($n = 191$; 45.5%)	Real or presumed qualities of other individuals or groups in setting a benchmark for an individual’s own behavior	“First, we had some difficulties with our new neighbours. Finally, we accepted their wish to add another floor because they have three children and need more living space”
Relying on others ($n = 143$; 34.0%)	Implicit or explicit feeling to rely on other individuals, groups, institutions or supernatural powers for problem-solving	“My husband always cares for me (...). It’s really wonderful and I miss it if he does not call for me”
Adjustment of standards/expectancies ($n = 107$; 25.5%)	Certain experiences (disappointments, frustrations) lead to an adjustment of future-directed systems	“After I finished school I wanted to become a teacher. But at this time, the prospects for teachers were rather bad. Thus, I started to train as banker”
Delay of gratification ($n = 68$; 16.2%)	Delay of gratification and putting aside own interests in favor of others	“My mother was in need of daily care for several years. Although I was very happy with my job, I quit when my mother was in need of daily care”
Positive reevaluation of situation ($n = 12$; 2.9%)	Finding positive aspects despite of negative or stressful conditions, when comparing it to past times or to the situation of others	“I lost my job because I had a lot of trouble with my new boss. Despite having less money, I am very happy about it, because it was a good chance to make a new start”

^a Reported frequency and percentage are based on whether the individual reported the use of the coping strategy in relation to a stressor experienced in any of the life domains under investigation (i.e., partnership, health, job, housing, and social). Because individuals could indicate more than one strategy, numbers do not add up to 100%

($p < 0.001$; Year 1 and 3). Four out of six correlations were significant, and one was marginal ($r = 0.09$, $p = 0.07$; Year 3 and 4). The correlations between events and well-

being at T2 also provided no evidence for a systematic, time-dependant bias (Table 3). Events reported for year 1 through 3 were linked to well-being at T2, with the

Table 3 Descriptives and intercorrelations of resources, overall life events, coping, and well-being ($N = 420$)

Variable	<i>M</i>	<i>SD</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. Events (sum years 1–4)	5.90	3.93											
2. Events year 1	1.38	1.66	0.60**										
3. Events year 2	1.43	1.52	0.58**	0.13**									
4. Events year 3	1.68	1.79	0.65**	0.23**	0.17**								
5. Events year 4	1.41	1.63	0.54**	0.05	0.15**	0.09 [†]							
6. Resources	0.00	0.61	−0.10*	−0.08	−0.02	−0.08	−0.06						
7. Control beliefs	3.77	0.59	−0.05	−0.05	−0.05	−0.02	0.00	0.12*					
8. Coping (sum overall)	36.71	13.91	0.15**	0.07	0.04	0.17**	0.07	0.13*	0.05				
9. Assimilation	21.82	9.41	0.07	0.04	−0.03	0.08	0.07	0.14**	0.04	0.90**			
10. Accommodation	14.88	6.76	0.21**	0.09 [†]	0.12*	0.23**	0.05	0.08	0.05	0.80**	0.47**		
11. Well-being (T1)	0.75	0.22	−0.22**	−0.15**	−0.13**	−0.17**	−0.08	0.17**	0.26**	0.13*	0.13**	0.08	
12. Well-being (T2)	0.79	0.22	−0.25**	−0.20**	−0.13**	−0.19**	−0.06	0.19**	0.19**	0.13*	0.15**	0.06	0.54**

Note: Constructs represent manifest variables. Coping, assimilation and accommodation refer to strategies assessed in relation to the events year 1 through 4

** $p < 0.01$, * $p < 0.05$, [†] $p < 0.10$

strongest link between events experienced about 4 years before the well-being assessment ($r = -0.20$, $p < 0.001$). The correlation of Events Year 4 (i.e., events experienced in the year before T2) to well-being at T2 was non-significant. This pattern of results stands in contrast to findings in which events were related to well-being only if they occurred directly (e.g., less than 6 months) before the well-being assessment. Due to the lack of a systematic bias in the event reports and relations across years, computing an overall event indicator seemed appropriate. Since the Event Year 4 indicator behaved slightly different than the others, we nevertheless conducted control analysis excluding this indicator, which did not change any of the findings.

Zero-order correlations among events, resources, control, and well-being

Correlational analysis showed that the total number of negative events experienced between T1 and T2 had a negative relation to well-being at T2, $r = -0.25$, $p < 0.001$ (Table 3), illustrating the impact of critical events on well-being. Well-being at T1 was also highly correlated to well-being at T2, highlighting the importance of addressing the present research questions prospectively so that initial well-being levels can be controlled for.

Resources were negatively correlated with number of events ($r = -0.10$, $p < 0.05$), which suggests that individuals with less resources were more likely to experience critical events, but the effect was rather weak. The number of events were related to overall coping ($r = 0.15$, $p < 0.01$), suggesting that individuals who experienced multiple events also used more strategies. Resources were weakly correlated to control beliefs ($r = 0.12$, $p < 0.05$) and to coping ($r = 0.13$, $p < 0.01$). In line with assumptions of the dual

process model (Brandtstädter 1999), resources were linked to assimilative strategies ($r = 0.14$, $p < 0.01$), but not to accommodative strategies. Accommodation was, in contrast, related to number of events ($r = 0.21$, $p < 0.001$), speaking to our assumption that a larger number of events might trigger the acceptance of the negative events rather than fighting them. Notable was the strong correlation between assimilation and accommodation ($r = 0.47$, $p < 0.001$), as both tendencies are often described as complementary.

Resources were furthermore positively correlated to well-being (T1: $r = 0.17$, and T2: $r = 0.19$, $ps < 0.001$). Those who reported more resources at T1 were also likely to have higher well-being levels at T2, speaking to the positive function of resources for adaptation.

Coping strategies were related to well-being at T2, although the effect was small ($r = 0.13$, $p < 0.01$). Separating both coping tendencies, assimilative coping was correlated to well-being at T2 ($r = 0.15$, $p < 0.01$), whereas accommodation had no relation to well-being.

Concurrent relations among resources, events, coping, and well-being

The concurrent effects of resources and coping on well-being in the context of negative events were investigated in a first SEM. In this and all following models, resources were represented by four domain-specific resource indicators (i.e., one unit-weighted composite for each sociodemographic, cognitive, social, and health resources), events were represented by event indicators for each year (i.e., 1 through 4), and coping was represented by five domain-specific indicators for each coping mode (i.e., assimilation and accommodation), by drawing on sum scores for the

problem domains job, housing, health, marriage, and children. The well-being constructs were represented by the subscale scores (i.e., aging satisfaction, non-agitation, life satisfaction) at T1 and T2. The measurement model provided an acceptable model fit [χ^2 ($N = 420$, $df = 236$) = 573.07, $p = 0.01$, $\chi^2/df = 2.43$, RMSEA = 0.058, CI = 0.052–0.064, IFI = 0.98, CFI = 0.98, TLI = 0.97; for further details please contact the first author]. For the structural model, we specified paths from resources to concurrent well-being (T1), as well as to events and coping. The model also tested paths from events to coping and from events and coping to well-being (T2). In order to control for stability in well-being, we also added a path from well-being T1 to well-being T2. The fit of the model was good (see Fig. 1). Resources had a significant negative path to events (standardized regression coefficient: -0.37 , $p < 0.001$), indicating that individuals with a higher resource status experienced fewer negative events. Resources also had comparably strong positive paths to coping (0.45) and to well-being at T1 (0.41, $p < 0.001$); higher resources apparently facilitated the use of coping strategies and enhanced well-being. In line with our expectations, events were highly positively linked to coping (0.67, $p < 0.001$), suggesting that individuals who experienced more events also used more coping. Events had furthermore a negative direct effect on well-being at T2 (-0.36 , $p < 0.001$). At the same time, coping had a positive effect on well-being at T2 (0.25, $p < 0.01$). Since one could assume that resources

could also have a longitudinal effect on well-being, we set up an additional model to test whether including a path from resources to well-being T2 would improve the model fit. The model fit did not change, χ^2 ($N = 420$, $df = 238$) = 590.29, $\Delta\chi^2 = 0.12$, $p = 0.73$, and the resources to well-being T2 path was non-significant. Therefore, we kept the more parsimonious model as reported above. Thus, when testing the concurrent effects of resources, events, and coping, result patterns did not change in comparison to the zero-order correlations reported earlier.

Assimilation and accommodation in relation to resources, events, and well-being

Addressing potential differences between assimilative and accommodative coping, we replaced the overall coping factor by two factors, one for assimilation and one for accommodation, and added a covariance between both. Separating both coping modes resulted in a substantially better model fit (see Fig. 2). The relation between both coping types was substantially reduced compared to their zero-order correlation (0.31, $p = 0.05$), which may indicate that the correlation was inflated due to shared measurement variance, and that, when controlling for such measurement error, both coping types were related, but far from identical. Splitting coping strategies in assimilation and accommodation revealed differential relations. First, events had a notably stronger path to accommodation (0.76, $p < 0.001$) than to assimilation (0.47, $p < 0.01$), suggesting that experience of critical life events was related to more coping

Fig. 1 Relations between resources, coping, and well-being in the context of negative life events. Structural equation model with the following fit: χ^2 ($N = 420$, $df = 239$) = 590.41, $p < 0.001$, $\chi^2/df = 2.47$, root-mean-square error of approximation (RMSEA) = 0.059, confidence interval (CI) = 0.053–0.065, incremental fit index (IFI) = 0.97, comparative fit index (CFI) = 0.97, Tucker–Lewis index (TLI) = 0.97. Standardized path coefficients are presented; WB well-being

Fig. 2 Relations between resources, assimilation, accommodation, and well-being in the context of negative life events. Structural equation model with the following fit: χ^2 ($N = 420$, $df = 235$) = 463.67, $p < 0.001$, $\chi^2/df = 1.97$, RMSEA = 0.048, CI = 0.042–0.055, IFI = 0.98, CFI = 0.98, TLI = 0.98. Standardized path coefficients are presented. WB well-being, AS assimilation, AC accommodation

use, but accommodation was triggered more strongly than assimilation. Second, assimilation had a significant path to well-being (0.17, $p < 0.05$), whereas accommodation strategies were unrelated to well-being. The benefit of coping seemed to be limited to assimilation, although events resulted in a stronger use of accommodation compared to assimilation. Notably, resources had equally strong paths to assimilation and accommodation (0.37 and 0.36, respectively, $ps < 0.01$). The other paths remained comparable to the overall coping model described earlier.

Control beliefs as moderator of the relations between resources, events, coping, and well-being

The third model set addressed the role of control beliefs as moderator. Particularly, we assumed that events would trigger assimilation and accommodation differentially depending on whether the individual would feel in control of his/her life, and that both coping tendencies would be differentially beneficial in terms of well-being depending on control beliefs. We therefore tested the model separating assimilation and accommodation as a two-group model and used a median split on internal control beliefs to separate high control individuals from low control individuals. The model fit was good [χ^2 ($N = 420$, $df = 471$) = 761.72, $p < 0.001$, $\chi^2/df = 1.62$, RMSEA = 0.038, CI = 0.033–0.043, IFI = 0.98, CFI = 0.98, TLI = 0.97]. In order to determine which paths were significantly different between

the groups of low and high internal control, we conducted a series of nested SEM models and compared their model fit (Table 4). In the baseline model, we set loadings, covariance, and error variances as well as all paths between resources, events, coping, and well-being to equal across both groups. As a prior set of analysis not reported had shown group differences on specific loadings and error variances (i.e., in 10 out of 48), we did not restrict those in the baseline and the following models (i.e., error variances of sociodemographic, cognitive, and health resources, events year 1, event year 2, event year 3, life satisfaction T1, non-agitation T2, and the loadings of sociodemographics, and life satisfaction T2). Supporting our hypothesis that individuals high in control may be better able to use assimilation strategies successfully, coefficients differed significantly between groups for the path of assimilation to well-being ($\Delta\chi^2 = 4.10$, $p < 0.05$). Statistically significant differences between low and high control groups were further found for the effects from events to well-being (T2), showing a significant effect for individuals low on control, but a non-significant effect for individuals high on control ($\Delta\chi^2 = 3.87$, $p < 0.05$). Marginal differences were found for the path from resources to accommodation ($\Delta\chi^2 = 3.72$, $p = 0.05$) and the path from well-being T1 to T2 ($\Delta\chi^2 = 3.30$, $p = 0.07$). The first effect suggests that low control individuals are somewhat more likely to use accommodation if they have more resources; no such link existed for high control individuals. The second effect indicates that although well-being depicts some stability over time in both groups, well-being was somewhat more stable for individuals low on control compared to individuals high in control. In the final model (Fig. 3), all paths were set equal except those that were found to be statistically different (i.e., assimilation to well-being T2 and events to well-being T2).

Table 4 Two-group models comparing low ($n = 223$) and high ($n = 197$) control individuals: testing for significant differences in path coefficients

Model	χ^2	df	$\Delta\chi^2$	p
Baseline model ^a	816.88	522		
Freed paths				
Resources–event	816.62	521	0.26	0.61
Resources–assimilation	815.50	521	1.38	0.24
Resources–accommodation	813.16	521	3.72 [†]	0.05
Resources–WB1	816.46	521	0.42	0.52
Event–assimilation	816.71	521	0.17	0.68
Event–accommodation	816.23	521	0.65	0.42
Event–WB2	813.01	521	3.87*	0.049
Assimilation–WB2	812.78	521	4.10*	0.04
Accommodation–WB2	816.77	521	0.11	0.74
WB1–WB2	813.58	521	3.30 [†]	0.07

^a All paths set to equals, and loadings, covariance, and error variances were also set to equal, except those that were found to differ between groups in a previous set of model comparison (i.e., loadings for sociodemographics, and life satisfaction T2; error variances for sociodemographic, cognitive, and health resources, events year 1, year 2, year 3)

p : exact p value, * $p < 0.05$, [†] $p < 0.10$

Discussion

The present study aimed at integrating several perspectives on stress caused by critical life events by examining resources, coping, and control beliefs as predictors of adaptation. Extending prior studies which often lack background characteristics such as resources and control beliefs, comprehensive measurement of coping strategies related to central life domains, and careful assessment of more than one critical event, our study allowed an in-depth look into several central mechanisms of adaptation and an investigation into their concurrent and interactive effects. Furthermore, the prospective design of our study allowed controlling for antecedent conditions such as resource status and levels of well-being assessed before the experience of multiple events, providing a powerful tool to investigate modifying factors.

Fig. 3 Relations between resources, assimilation and accommodation and well-being, divided by individuals with low and with high internal control beliefs (Two-Group SEM; first number of pair: path coefficient for low control group; second number: path coefficient for high control group). Boxes indicate statistically different path coefficients. Model fit: χ^2 ($N = 420$, $df = 520$) = 811.69, $p < 0.001$, $\chi^2/df = 1.56$, RMSEA = 0.037, CI = 0.032–0.041, IFI = 0.98, CFI = 0.98, TLI = 0.98. WB well-being, AS assimilation, AC accommodation

Our study replicated earlier findings, but also revealed some more complex relations. Study findings indicate that negative life events result in a decline of well-being in middle-aged individuals, paralleling earlier studies (Holahan et al. 2005). In contrast to Suh et al. (1996), we found no systematic differences regarding time of event occurrence. The events experienced up to 4 years before T2 were as strongly related to well-being as events experienced closer to T2. Events experienced during the year before T2 even seemed less strongly correlated with well-being. The discrepancy between our and Suh et al.'s findings might be related to event assessment. When asking for events without giving any memory cues as done in the present study, individuals may only indicate events that they still perceive as relevant, which may result in a stronger, less time-dependent relation to well-being. Assessing events with a list may, in contrast, result in naming more events that have already lost their influence on the participants. This explanation is supported by the findings from Eronen and Nurmi (1999), who assessed events with a list, but instead of asking participants to report all events at the last measurement point, they applied it for three consecutive years. Paralleling our findings, they also found that the events most closely to the outcome assessment would not necessarily have the strongest effect.

Examining the relation between resources and events, findings showed that the resources assessed such as sociodemographic factors, cognition, health, and social network had a negative association with the number of events that occurred later. This means that individuals with more

resources were less likely to experience negative life events. This finding is in line with prior studies showing that critical life events are related to personal characteristics such as low socioeconomic background (Kendler et al. 1999) or personality (Eronen and Nurmi 1999; Headey and Wearing 1989). Control beliefs, in contrast, had no relation to the number of negative events.

Participants reported more coping strategies when confronted with more negative events, suggesting that they used and perhaps developed more diverse strategies while handling the challenges related to the events. This result parallels findings from Punamäki and Puhakka (1997), showing that children confronted with more stressful events had a larger coping repertoire. This finding also speaks in favor of our methodological approach, showing that assessing an event and asking explicitly how individuals reacted to it has a higher specificity and should therefore result in more reliable information compared to assessing trait-like coping tendencies without explicit situation reference.

Considering the positive association between resources and coping, basic resources seem to facilitate the use of coping strategies, replicating results from Holahan and Moos (1987). More resources were related to higher concurrent well-being, but there was no direct longitudinal effect. Coping was also linked to better adaptation, confirming findings from prior studies (Holahan and Moos 1991; Staudinger and Fleeson 1996). Extending these prior findings, our study further indicates differential paths for specific coping strategies. Splitting assimilation and accommodation enhanced the model fit and resulted in differential paths between coping and well-being, with assimilation having a positive effect and accommodation having no effect on well-being. Active problem-solving strategies thus seem to be more beneficial for middle-aged adults confronted with multiple life events than adjusting their standards in an accommodation effort.

Findings also showed that the effect of resources on well-being was mediated by assimilative coping. In line with Brandtstädter's dual process theory (e.g., 1999, 2006), resources had a positive effect on assimilation, indicating that assimilative strategies are more often used when individuals have more resources available, which in turn enhances well-being. Against our assumption, resources were also important for accommodation. This only changed when taking control beliefs into account.

In our sample, control beliefs were positively correlated with resources, indicating that resource-rich individuals also had a higher feeling of control. Whereas studies in the memory context showed that older adults with higher control beliefs used more effective memory strategies (Lachman and Andreoletti 2006), we found no relation between control and coping strategies. Adding control beliefs as a moderator revealed differential effects between events,

coping, and well-being, supporting our assumption that allowing for more complex associations helps to uncover more specific relations. For low control individuals, negative life events had a strong negative direct effect on well-being, but the same effect was significantly smaller for the high control individuals. This suggests that feeling in control reduces the negative impact of the events and that people with higher control beliefs were better able to adapt. The more complex model also revealed that only high control individuals benefited from assimilative coping, but low control individuals did not. This suggests that, against our expectation, high and low control individuals do not differ in whether they use assimilative coping when faced with events, but that, supporting our assumption, control levels determine the effect of assimilation with respect to well-being. One possible explanation is that individuals who feel in control over their life apply assimilative strategies more efficiently, whereas individuals with poor control beliefs may be less persistent and give up active problem-solving more easily.

That we also found a tendency for resources to be somewhat more strongly related to accommodation only in low control individuals adds to this more complex picture. Individuals with low control beliefs may be better able to adopt new views (e.g., reframe the critical situation or make sense out of it) if they have a strong resource potential that helps them to balance out the effects of the critical events. For individuals with high control beliefs, use of accommodative coping is apparently independent from their resources. Thus, the differential effects found when taking control beliefs into account highlight the benefits of internal control beliefs when faced with critical life events, as advocated in research by Krause (1986). In sum, the findings of the present study indicate that the combined investigation of resources, coping, and control beliefs in the context of handling critical life events is promising since their functional interplay helps to better understand individual differences in adaptation.

Limitations

Despite its notable advantages, the study has limitations which need to be acknowledged. First, experience of negative events can be assumed to trigger resource change, which was not measured in the present study. Given that baseline resources were important for the use of coping strategies, considering change in resources seems highly desirable for future studies. Such studies could further assess individuals' perceptions of resources to complement objective indicators, as they could be more relevant to motivate the utilization of coping strategies.

Second, assessment of coping strategies in direct relation to the events can be considered as problematic. We

asked participants about critical life events they experienced and their methods of handling them. Thus, one could argue that there is a certain dependency between both events and coping, as the experience of a larger number of events could have resulted in reporting more coping strategies. The relation between number of events and coping was, however, not especially strong (despite being significant), which may speak against an enhanced link due to methodological issues. Instead, it demonstrates that people may have a tendency to use more strategies when being challenged by more events, but are far from reacting uniformly with more coping. We are convinced that the direct fit between event and coping addressed in the context of these events has enhanced the quality of the data and that our approach is a better alternative rather than using more general, trait-like coping measures. Nevertheless, to better compare the event reports of our study to other research, adding a standardized list of events and coping questionnaire would have been beneficial.

A third shortcoming refers to the comparison between high and low control groups. We did not find measurement invariance between high and low control individuals, as there were some differences regarding loadings and error variances. As only 2 out of the 24 factor loadings were invariant, we would argue that weak factorial invariance can still be assumed. Nevertheless, the measurement seems not to be identical between both groups, which asks for some caution in interpreting the group-differential findings.

Finally, due to our focus on middle-aged individuals, it is not clear whether the pattern of results is specific to this age. For instance, we found that the relation between assimilation and accommodation strategies was rather high, which stands in contrast to Brandtstädter's (1999) theory. Boerner (2004), however, reported the same finding when investigating middle-aged individuals with visual impairment. Thus, the higher link between both coping modes could be related to the age group, the substantial stress they experienced, or both. Thus, research is called upon that tests these effects with other age groups, either younger or older, to determine whether the findings are limited to middle age, or whether they hold for other ages, in order to refine theory. As resources and assimilation are prone to age-associated changes, more stable factors such as accommodation and control beliefs may play an increasingly important role for adaptation to negative life events.

Conclusion

The present study shed light on factors crucial for dealing successfully with multiple negative life events. Our findings indicate that integrating the resource and coping perspective on stress while also taking into account control

beliefs is beneficial for predicting adaptation to multiple events. Prospective studies with explicit assessment of events and of crucial adaptation mechanisms like ours help bridge the gap between the life event and the coping tradition. Concurrent examinations of adaptation mechanisms such as resources, coping, and beliefs will advance the study of adaptation to critical life events, a field which has claimed to be in need of a stronger theoretical framework (Filipp 1995). Our differential findings further encourage research that goes beyond simple effects and to look at more complex patterns of findings. As demonstrated by the present study considering resources, control beliefs as well as differentiating between assimilative and accommodative coping unveiled important individual differences which could advance theory development and research. Since coping with difficult life situations depends on more than just one characteristic, more complex functional relationships are more likely to reflect reality. More detailed examination of the unique and shared effects of resources, control beliefs, and coping thus seems needed to refine our theoretical models on handling negative life events.

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