Personal growth and cognitive complexity in caregivers of patients with dementia

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Abstract According to several theoretical models, crises or demands can result in enhanced cognitive maturity. Two studies examined whether demands on caregivers provide an opportunity to experience increased cognitive maturity (e.g., cognitive complexity, personal growth through caregiving). In Study 1 (126 relatives of dementia patients; cross-sectional design), personal growth through caregiving was associated with two specific caregiving demands: duration of caregiving and lack of social acknowledgment. Cognitive complexity correlated with duration of caregiving and crystallized intelligence. The caregivers in the second study ($N = 321$) were participants in LEANDER, The Longitudinal Dementia Caregiver Stress Study. Caregivers were examined in four waves over 27 months. The results indicated an increase in personal growth over time. Using latent growth models, we found that increases in personal growth through caregiving were predicted by increases in the objective caregiving tasks. Cognitive processes (e.g., ruminative thoughts, life reflection) provide a possible explanation for an increase in cognitive maturity.

Keywords Personal growth · Cognitive complexity · Caregiver · Dementia

Introduction

Much of the research on caregiving has focused on negative aspects, such as the associated burden, demands, stress, and depression. Providing care to individuals with dementia has been shown to be highly stressful for relatives (Pinquart and Sörensen 2003; Schacke and Zank (2008); Schulz et al. 1995, 2003). The present study focuses on how caregivers can gain new insight into themselves and their situation. In the literature, these phenomena often have been labeled as maturity, growth, or complexity (Bauer and McAdams 2004; Labouvie-Vief and Diehl 2000). In the following, we use the term *cognitive maturity* as a broader concept, which includes two forms that we call *personal growth through caregiving* and *cognitive complexity*.

According to Ryff (1989), personal growth is a component of psychological well-being that involves feelings of continued development, seeing one self as growing and expanding, being open to new experiences, seeing improvement in self and behavior over time, and being able to change in ways that reflect more self-knowledge and effectiveness. Another approach to maturity is rooted in models of cognitive development and complex thought (Bauer and McAdams 2004; Labouvie-Vief and Diehl 2000; Loevinger 1976). Complex thought refers to concepts like postformal operations, mature thinking, and cognitive complexity. Adult development researchers have proposed a stage of postformal operations, referring to the ways in which adults structure their thinking, above and beyond those Piaget called formal thought in adolescents (e.g., Commons et al. 1990; Sinnott 1998). Postformal thinking incorporates cognitive processes that are specifically geared to the complex nature of adult life. Related concepts are Labouvie-Vief's articulation of complexity (e.g., Labouvie-Vief and Diehl 2000), wisdom-related knowledge (Baltes

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and Staudinger 2000), ego development (Loevinger 1976), and Riegel's (1979) dialectical perspective where crises are seen as the motor of development in adulthood. According to Loevinger (1976), individuals organize their lives and world in increasingly complex ways. The levels of ego-development (Hy and Loevinger 1996) mark the degrees of complexity with which individuals understand themselves, others, and social situations.

In this study, we use Ryff's (rather general) concept of personal growth to refer to the caregivers' situation and prefer the term *personal growth through caregiving* to describe growth resulting specifically from the caregiving situation, rather than from life experience in general. The rationale for this limitation is the similarity of *personal growth through caregiving* to complex and mature thinking, considered an important prerequisite for coping with critical life events or stress (e.g., Brandtstädter and Rothermund 2002; Leipold 2004; see below).¹

Predictors of personal growth, cognitive complexity, and related concepts

For many people, life challenges and loss threaten the order and predictability of their lives. There is, however, considerable evidence that adversity may also have benefits. It has been argued that stress provides a context conducive to personal development in adulthood (Aldwin 1994). Many authors have used the notion of posttraumatic growth to conceptualize the process by which people describe positive change as having resulted from trauma or crisis (Cadell et al. 2003; Davis and McKearney 2003; Sears et al. 2003; Tedeschi et al. 1998).

Cross-sectional research on personal growth by Ryff and colleagues has consistently shown reduced personal growth in older adults compared to middle-aged and younger adults (e.g., Ryff 1989). The negative difference between the middle-aged and older adults (although confounded by cohort effects) can tentatively be interpreted as indicating that it is not ongoing time per se that is necessary for personal growth development, but rather that personal growth results when underlying cognitive processes (e.g., life reflection; Staudinger 2001; see below) have been at work.

¹ Although Ryff's concept of personality growth was developed as an indicator of psychological well-being, a conceptual overlap between cognitive complexity and personality growth does exist. Our aim in this study was primarily to use different indicators to investigate cognitive maturity; that is, personality growth (through caregiving) is a subjective measure that represents the individual's having experienced new insights (as reported in the questionnaire). On the other hand, cognitive complexity is, similar to achievement or intelligence, an "objective" measure in which the degree of complexity is assessed by test raters.

Furthermore, personal growth has also been shown in multiple datasets to be linked to education (Ryff 1989). Personal growth is higher in individuals with college degrees than in individuals with only high-school levels of education.

The existing literature indicates that the stressful role of caregiving is associated with personal growth or related concepts such as finding meaning (Farran and Kuhn 1998), personal gain, or management of meaning (Dupuis et al. 2004). Seltzer and Li (2000) examined three caregiving transitions (entry into caregiving role, institutionalization, and bereavement) but their findings were inconclusive. In a comparison over a 3-year time period, they found no time effect but a group effect: Caregivers whose relatives were institutionalized during the 3 years reported lower personal growth than caregivers whose relatives had already been institutionalized at first time of measurement. The bereaved wives reported increases over time in personal growth following their husbands' deaths, whereas wives continuing in the caregiving role reported a decline. However, correlations between the transition and the duration of caregiving must be taken into consideration. The husband's death suggests duration of caregiving might have been longer.

Bereaved caregivers (HIV/AIDS) were the subjects of a study by Cadell et al. (2003). In this study, spirituality, social support, and stressors were found to have a positive relationship to personal growth. Thus, the more stress experienced (impact of critical events and depression) by an individual, the more growth he or she evidenced. These results converge with the findings from Sears et al. (2003), who investigated women with early-stage breast cancer. Greater perceived cancer stress and longer time since diagnosis predicted more posttraumatic growth. Furthermore, there is evidence that caregivers who found meaning in and subjective benefits from caregiving showed less depression or higher life satisfaction (Farran et al. 1999; Haley et al. 2003; Kim et al. 2007).

Studies on cognitive complexity can only be considered outside the caregivers' domain. Cognitive complexity is strongly predicted by variables, such as intelligence, creativity, and education (Newman et al. 1998; Labouvie-Vief and Diehl 2000).

At this point, we need to consider what underlying processes (mediating cognitive processes) could provide a possible explanation for the link between stress and mature thinking. Some of these processes have been subsumed under the heading "reminiscence", which can be described as a means to understand one's own past and gain a better understanding of changes. Although not directly examined in this study, reminiscence (e.g., ruminative thoughts, escapist thoughts, and life reflection) was selected to illustrate the relationship between caregiving demands and cognitive maturity (Webster and Haight 2002). We argue

that mature thinking depends on cognitive processes such as reminiscence that can themselves be triggered by demands or critical life events.

According to Filipp (1998), “bad news” (e.g., critical life events, losses, threats, is-ought discrepancies) leads to ruminative thoughts, which are automatic and intrusive in nature. Although at first glance correlated with negative emotions (e.g., anxiety, hopelessness), rumination has been considered a necessary step in the coping process. Ruminative thought includes both the repeated confrontation with memories of the crisis and the perception that one self has changed in a special domain. It is related to explaining what happened, the individual’s search for causes or reasons. Cognitive resources such as attention are directed toward the problem. Through rumination, the search for and availability of relevant cognitions (e.g., possible causes of and solutions to the problem) are enhanced, which can be seen as a condition favorable for developing cognitive maturity. Intrusiveness and repetitive awareness are only two characteristics of rumination, and our emphasis is on the repetitive awareness and the search for reasons and causes that can result in a more complex analysis.²

Ruminative thoughts, possibly because intrusive and non-intentional in character, can lead to a further form of cognitive (stress) processing that has been introduced as life review (Butler 1963) or life reflection (Staudinger 2001). Both terms are defined as the remembering of life events plus the further analysis of these events (Why did it happen? What are the reasons? What does it mean for my future life?). According to Staudinger, “further” analysis refers to the extent and sophistication of the analysis (the amount of explanation and evaluation; e.g., categorization, abstraction, social and temporal comparison) of the material. Thus complex thought is a result of a critical-reflective analysis of one’s own life.

Finally, the question remains as to what extent a caregiving situation can contribute to mature thinking or personal growth. In the case of caregivers of dementia patients, a study conducted by Leipold et al. (2004) illustrates the role of the cognitive processes related to specific forms of caregiver burdens and demands. These cognitive processes can be seen as an indication of whether mature thinking has occurred. Specifically, restrictions to personal needs (e.g., in leisure-time activities, reduced time and

sleep) and perceived loss and grief (related to changes in the patients’ personality and behavior) were related to escapist thoughts (a form of reminiscence in which people think and “live” in the past which also can be used as an immunization against actual problems). Although preoccupation with the past can help maintain a steady state of psychological functioning in some cases, escaping may also render the individual less effective in thinking about and dealing with present demands (Brandtstädter 2007). In contrast, caregiving tasks (necessary assistance with activities of daily living) and lack of social acknowledgment were correlated with ruminative thoughts, which in turn can be viewed as a cognitive mode of explaining what had happened (Filipp 1998), that is, a search for causes or reasons by the caregiver that can result in mature thinking.

A study by Robertson et al. (2003) partly supports this assumption. Greater need for help with activities of daily living by the dementia patient was associated with more gains in the caregiver (e.g., feeling competent in one’s own ability to care). Altogether, the evidence on specific characteristics of the caregiving situation and mature thinking is scarce. Unfortunately, comparisons between the studies cited above are difficult in (at least) two respects: first, dementia caregiving differs in important ways from other forms of caregiving; second, because there is no agreement on how to define benefits, the outcomes differ in content.

Research questions and hypotheses

The primary goal of our research was to explore the link between personal growth and care-related variables (e.g., assistance with activities of daily living, restrictions to personal needs). Previous research suggests positive relations between critical life circumstances (e.g., burden, caregiving stress) and personal growth; however, evidence about which specific characteristics of the stress situation might provoke mature thinking is scarce. We refer to reminiscence processes (which were not subject of investigation in this study) to render our research questions more precise (i.e., to examine the specific demands possibly related to cognitive maturity). Restrictions in caregivers’ personal needs and perceived loss and grief have been found to correlate with escapist reminiscent thoughts (Leipold et al. 2004), which seem not to be conducive to life reflection and mature thinking. Escapist thoughts can, however, be seen as an immunization tendency such that actual problems are being repressed or replaced by concentration on events that happened in the past. In contrast, caregiving tasks (necessary assistance with activities of daily living) over a longer period are negatively related to ruminative thoughts. Thus one could tentatively hypothesize that critical-reflective analysis (life reflection) helped in processing care-specific stress and resulted in more mature thinking. Social problems in particular, because

² Action theory suggests that individuals usually begin to reflect on their own development when confronted with problems of action orientation (Brandtstädter 2006). In this view, rumination occurs particularly in stress episodes when assimilative (problem-focused actions) and accommodative (re-evaluation; reframing) coping tendencies are at work at the same time, and the individual is torn between both. At this point in a coping episode, the individual is unclear whether to use problem-solving strategies or to give up (e.g., accept situation as an inevitable constraint, reframe it; c.f., Brandtstädter 2007, p. 61).

of their high relevance for one's self-definition and emotional valence, have been considered an important trigger for the development of mature thinking (Hormuth 1990; Mickler 2004). A specific caregiving situation in which social problems are predominant (e.g., lack of social acknowledgment) could also be a predictor of mature thinking.

The duration of caregiving is also worthy of further consideration. Although duration has no explanatory value per se, it is correlated with many events and changes in the caregiving process and may indicate a time in which cognitive processes such as life reflection are activated. In contrast to age, duration is related directly to the caregiving situation, a period of time with unusual caregiving stress. If stressful life events, crises, or burden contribute to mature thinking, then, in contrast to age, duration of caregiving should also be related to mature thinking.

In Study 1, a cross-sectional study design was used to test the hypotheses. In this study, we used two indicators of mature thinking: a questionnaire of personal growth through caregiving and an indicator of cognitive complexity, derived from models of cognitive development and complex thought (e.g., Baltes and Staudinger 2000; Bauer and McAdams 2004; Labouvie-Vief and Diehl 2000; Loevinger 1976). On the basis of our theoretical arguments, we assumed that there would be a positive relationship between personal growth through caregiving and objective caregiving tasks, social problems (e.g., lack of social acknowledgment), and duration of caregiving. In contrast, restrictions in personal needs and loss and grief have been found to correlate with escapist thoughts, which possibly impede life reflection. Furthermore, we investigate whether these relationships also occur in the case of cognitive complexity, the more general indicator which is independent of social desirability and more similar to higher educational level and intelligence. In this case, duration is perhaps the only predictor of cognitive complexity in that it includes broad scope of care-related stressors and, simultaneously indicates a long time in which these stressors can be critically reflected upon.

In Study 2, we examined longitudinal patterns of personal growth through caregiving. First, we asked to what extent did caregivers manifested changes in care-specific personal growth over a 27-month period of time. If our hypothesis is correct that a longer duration of caregiving correlates with personal growth through caregiving, then an increase over time can be expected. Furthermore, we investigated whether different caregiver stress dimensions (assistance with activities of daily living, lack of social acknowledgment) contributed to changes in personality growth through caregiving.

Both studies are part of the broader research project LEANDER (The Longitudinal Dementia Caregiver Stress Study; Zank and Schacke 2007; Zank et al. 2006). At T1, 888 caregivers of dementia patients participated. One

hundred twenty-six of these 888 participants also completed the measures described in the following section ("Study 1"). A total of 435 caregivers (children/partners) provided complete data at the baseline and at the 9-month follow-up assessments ("Study 2").

Study 1

Method

In Study 1, participants were members of support groups for caregivers in Berlin and Brandenburg, the surrounding countryside. Of the 40 support groups found via internet, 27 took part in this study. Through telephone calls with the coordinators of group meetings, appointments were made for caregivers to participate in the study at the locations where the group usually met. In a group session, measures of intelligence, global personal growth, and cognitive complexity were collected. Each caregiver who had agreed to participate also completed a series of questionnaires at home. To verify the presence of clinical dementia symptoms as well as to assess their severity, raters with intensive training conducted a structured telephone interview based on the ICD-10 criteria for dementia. In addition, we asked whether official medical diagnoses of dementia had been made. The telephone interview also provided information about the caregiving situation, the extent of the burden, and the patient's characteristics. Caregivers primarily responsible for the patient's care were eligible to participate.

Participants

Participants were 126 caregivers (94 women and 32 men) recruited from 27 informational support groups for caregivers. They ranged in age from 32 to 84 years ($M = 61.3$; $SD = 10.0$). Most had a low level of education with 9 years of schooling or less (41%), 34% had a medium educational level with 10 years of education, and 25% had a high educational level with 13 (12^3) years of education. Eighty-three percent were married, 17% were unmarried, widowed, or divorced. Over 80% were children or partners of the patients. Approximately one-fifth were currently employed. At the time of the initial interview, caregivers reported having provided care to the recipient for an average of 41 months ($SD = 28$).

Caregivers were providing care for patients with a broad range of dementia severity levels. Ninety-four percent of the patients had a diagnosis of dementia. The telephone interviews with caregivers revealed that, according to

³ In the former East Germany, the highest school track was attended with 12 years.

ICD-10 criteria, 13% of the care recipients had a mild level of cognitive impairment, 49% had a moderate level, and 38% were severely demented. The patients (72 women; 54 men) were about 75 years old, ranging in age from 49 to 97 years ($M = 75.1$; $SD = 9.7$). Sixty-one percent lived in the same house as the caregiver.

Measures

In addition to the information about the patient's situation obtained in the telephone interview with the caregivers, measures of cognitive complexity as well as an indicator of intelligence were administered in the self-help groups of two to ten participants. Caregivers also completed a set of self-administered questionnaires at home, which included measures of caregivers' stress and personal growth through caregiving.

Cognitive maturity

Cognitive complexity

Ego level is a widely used and well-validated measure of cognitive complexity (Westenberg et al. 1998). Ego level was assessed through the short form of the Sentence completion test (Hy and Loewinger 1996). This test consists of 18 sentence stems (e.g., "Raising a family...."). Each sentence completion item was scored on an 8-point scale by one of two trained coders using the procedure outlined in the scoring manual for training and coding. At lower levels, responses are indicated impulsivity, egocentrism, and bodily feelings; at higher levels, responses are characterized by acceptance of conflict and a focus on self-realization and psychological causes. The internal consistency of the 18 items was $\alpha = 0.74$. To assess interrater reliability, a subsample (30 protocols) of 126 protocols was each scored by two raters. The interrater reliability for the two raters was $\alpha = 0.71$ for this set of double-coded items.

Personal growth through caregiving

Personal growth through caregiving refers to a care-specific feeling of growing insight (e.g., "Through caregiving, I have gained a new idea about what is important in life"; $\alpha = 0.91$). To measure care-specific growth, the five items in this study were selected from Ryff (1989) general personal growth scale and "through caregiving" was added to each item.

Care-specific measures

Care-specific variables were measured via subscales from Zank et al. (2006) developed to assess different dimensions of caregiving stress.

Objective caregiving tasks

An objective measure of caregiving tasks was obtained using four subscales assessing the frequency of activities required to compensate for the patient's restrictions: (a) activities of daily living (ADL; seven items), (b) instrumental activities of daily living (IADL; three items), (c) supervision (four items), and (d) emotional support (four items). These four scales were highly correlated (0.54–0.71) and indicated high factor loadings on one dimension (0.84; 0.82; 0.85; 0.53). This dimension was labeled as Caregiving Tasks ($\alpha = 0.77$ over the four scales).

Loss and grief

This scale consists of five items (e.g., "I feel that I have somehow lost my relative") and refers to a patient's loss of personality. A 5-point Likert-type scale for each item was used ($\alpha = 0.84$).

Lack of social acknowledgment

Four items indicate the lack of social acknowledgment for the patient's and the caregiver's situation (e.g., "I feel that others do not appreciate the situation I am in"; $\alpha = 0.87$; 5-point Likert-type scale).

Restrictions in personal needs

This scale consists of nine items which indicate restrictions in personal needs and interests (e.g., "I feel that I have too little time for my interests and hobbies"; $\alpha = 0.94$; 5-point Likert-type scale).

Duration of caregiving

Caregivers were asked how long they had provided care (in months).

Education and crystallized intelligence

Finally, demographic indices used included participants' education (assessed as degree of schooling: 1 = no school track, 2 = lowest school track, 3 = middle school track, 4 = highest school track, and the kind of vocational training: 1 = no vocational training, 2 = apprenticeship, 3 = vocational school, 4 = graduate). Education and vocational training were highly correlated ($r = 0.61$) and the mean score was used in the analyses.

The multiple-choice vocabulary test A (MWT-A; Lehrl et al. 1991), a widely used German vocabulary test, served as a measure of crystallized intelligence. Thirty-seven items, each containing one word and four non-words, were

presented in a paper-pencil format. The caregiver's task was to identify the word.

Cognitive complexity has been found to be correlated with socioeconomic status and education, or intelligence. Therefore, these will be used as a control variable in the following analyses.

Results

Analyses and results are presented in two sections. In the first section, we report correlations of the variables used in this study. In the second set of analyses, we used a set of hierarchical regression models (Cohen and Cohen 1983) that tested the prediction for each of both variables.

Correlations

The bivariate correlations of the variables included in the regression analyses are presented in Table 1. Advanced age was negatively related to crystallized intelligence. Age was also related to loss and grief and a long duration of caregiving. The negative correlation between age and gender means that male caregivers in the younger age groups (usually the sons of the dementia patients) were under-represented. Caregiver demands (objective caregiving tasks, loss and grief, lack of social acknowledgment, restrictions in personal needs) were related to each other. Cognitive complexity was positively related to education, crystallized intelligence, and duration of caregiving. Personal growth through caregiving was predicted by care-specific demands (duration of caregiving, caregiving tasks, loss and grief, lack of social acknowledgment, restrictions in personal needs), and by lower crystallized intelligence.⁴

Hierarchical multiple regressions

In this step of the analyses, we examined the relation of both indicators of cognitive maturity to age, gender, crystallized intelligence, education and caregiving demands. Regression analyses were conducted to test whether the care-specific variables could be considered predictors of personal growth. Both analyses followed the same regression procedure: In the first step, each indicator of personal growth (cognitive complexity, personal growth through caregiving) was predicted from age, gender, education, and intelligence. In the second step, the care-related variables were entered into the

regression equation with the former independent variables' contribution to cognitive complexity and personal growth through caregiving now being controlled.

Results are presented in Table 2. Age, gender, intelligence, and education accounted for a total of 23% of cognitive complexity variance, but only crystallized intelligence showed a significant beta. The addition of care variables in Step 2 added 7% explained variance to the equation, with a longer duration of caregiving being more likely to show high scores on cognitive complexity. In the second analysis, duration of caregiving and lack of social acknowledgment significantly accounted for differences in personal growth through caregiving.

Study 2

Method

In a cross-sectional design in Study 1, duration of caregiving and lack of social acknowledgment were identified as care-specific predictors of personal growth through caregiving. The aim of Study 2 was to investigate, over a 27-month period, the change in personal growth through caregiving. We expected an increase in personal growth over the 27-month period. Because of previous results with concomitant reminiscence styles and the scarce empirical evidence on the development of personal growth through caregiving, we had made the cautious hypothesis that objective caregiving tasks and lack of social acknowledgment would be predictors of change in growth through caregiving.

At Wave 1, 888 caregivers (Zank and Schacke 2007; Zank et al. 2006) took part in this study. By Wave 4, 301 caregivers (34%) were no longer eligible because the patients had died. Of the remaining 587 caregivers, 321 were interviewed at Wave 4 (=drop out rate of 45%). We conducted a series of comparisons between the participants ($n = 321$), the drop-outs ($n = 266$), and the non-participants due to patient's death ($n = 301$). Dropout analyses revealed significant results, although with very small effect sizes. Those who participated and those who did not participate because of missing data or refusal were similar except that dropout was related to lower personality growth through caregiving ($r = -0.10$; $P < 0.05$; point-biserial correlation). The continuers and the caregivers whose relatives had died were similar except that dropout was related to longer caregiving duration ($r = -0.12$; $P < 0.01$).

Most of the caregivers at Time 4 were married (85%) and female (79%). They averaged 59.5 years of age at Wave 1 ($SD = 10.9$). Twenty-three percent had a higher educational level. Most of the care recipients were female (67%), 12% had a mild level of cognitive impairment, 54% had a moderate level, and 34% were severely demented.

⁴ Cognitive complexity was not correlated with personality growth through caregiving. However, after controlling for education and crystallized intelligence, which were important predictors of cognitive complexity, some of the relationships increased. The partial correlation between cognitive complexity and personal growth through caregiving was then 0.25; $P < 0.01$.

Table 1 Study 1: Pearson product–moment correlations variables ($N = 126$)

Variables	1	2	3	4	5	6	7	8	9	10
1. Age	1									
2. Gender (0 = male; 1 = female)	−0.33**	1								
3. Education	−0.06	−0.14	1							
4. Crystallized intelligence	−0.19*	0.10	0.53**	1						
5. Duration of caregiving	0.24**	−0.02	−0.01	−0.03	1					
6. Caregiving tasks (BADL/IADL)	−0.02	−0.09	−0.05	−0.15	0.18*	1				
7. Loss and grief	0.22*	−0.05	−0.18*	−0.15	0.23**	0.15	1			
8. Lack of social acknowledgment	0.00	0.17	−0.17	−0.22*	0.00	0.13	0.38**	1		
9. Restrictions in personal needs	0.13	0.19*	−0.10	−0.08	0.12	0.30**	0.40**	0.58**	1	
10. Cognitive complexity	−0.13	0.15	0.30**	0.46**	0.23**	0.01	−0.07	−0.06	0.05	1
11. Personal growth through caregiving	0.10	0.05	−0.04	−0.25**	0.26**	0.22*	0.18*	0.45**	0.34**	0.09

* $P < 0.05$, ** $P < 0.01$ **Table 2** Hierarchical regression analyses of different predictor sets on the personal growth scores ($n = 126$)

Predictor variable	Cognitive complexity β	Personal growth through caregiving β
Step 1		
Age	−0.01	0.10
Gender (0 = male; 1 = female)	0.13	0.14
Education	0.11	0.16
Crystallized intelligence	0.39**	−0.33**
r^2 increment	0.23**	0.10*
Step 2		
Age	−0.07	0.04
Gender	0.10	0.04
Education	0.10	0.15
Crystallized intelligence	0.40**	−0.23*
Duration of caregiving	0.27**	0.25**
Caregiving tasks (BADL/IADL)	0.02	0.11
Loss and grief	−0.06	−0.09
Lack of social acknowledgment	0.02	0.40**
Restrictions in personal needs	0.06	0.08
r^2 increment	0.07*	0.24**

The values are standardized beta coefficients

* $P < 0.05$, ** $P < 0.01$

Seventy-three percent co-resided with their caregivers. Patients ranged in age from 47 to 101 years ($M = 79.18$; $SD = 9.04$).

Data collection and measures

Participants were recruited throughout Germany through several newspaper announcements. Caregivers interested in participating were asked to contact project staff members.

We collected data by interviewing the caregivers by telephone. A structured interview based on the ICD-10 criteria for dementia was conducted by trained interviewers. Caregivers who were primarily responsible for the dementia patient's care were eligible to participate. If caregivers were willing to participate, they were also asked to complete a set of self-administered measures. The return rate at Wave 1 (88%) was very satisfactory.

Measures

At each measurement time (Time 1–4), caregivers were sent a questionnaire which they completed and returned to us. The questionnaire contained the Personality Growth through Caregiving measure (based on Ryff 1989), and care-specific measures (objective caregiving tasks, loss and grief, lack of social acknowledgment, and restrictions in personal needs; Zank et al. 2006). These scales are described in Study 1; the appendix shows the intercorrelation between the variables.

Results

Analyses and results are presented in two sections. In the first section, we investigated differences in the mean level of personality growth through caregiving. In the second section, we used hierarchical regressions to identify sources of differential change in personality growth through caregiving. Our research question was whether caregiver variables were related to changes in personal growth over time.

In the first step, change in personal growth through caregiving was analyzed with repeated measures ANOVAs. As expected, a significant increase in personal growth through caregiving was found during the 9-month period

($M_{T1} = 2.59$; $SD = 0.92$; $M_{T2} = 2.72$; $SD = 0.87$; $M_{T3} = 2.78$; $SD = 0.85$; $M_{T4} = 2.84$; $SD = 0.88$); $F(3, 318) = 8.34$, $P < 0.01$. The measurement occasion effect accounted for 7.7% of the variance (eta-squared). Cross-sectional correlations with age were not found, which suggests that it is not growing old per se, but rather the demands or stressors of caregiving that trigger personal growth.

Latent growth modeling techniques were used to examine changes in personal growth through caregiving (McArdle 2005). Two latent variables, an intercept component (level score) and a slope component (change score), were extracted from the four observations across time. The intercept component contributes equally to all four observation points, and a linear slope component was defined by fixing those parameters to 0, 1, 2, and 3 for the observed variables. Individual differences in the intercept and slope components were then examined as a function of the primary predictor variables of interest. A model was specified in which personal growth through caregiving was predicted by caregiving demands, duration of caregiving, and age. Age and duration of caregiving have been analyzed as exogenous variables whose variation is assumed to be determined by causes outside the hypothesized model.

Figure 1 presents the model that examined the longitudinal impact of the care demands. For ease of presentation, only the significant path regressions are provided. However, all correlations between care demands, and all path regressions between care demands and personal growth through caregiving were estimated. Furthermore, the path regression between duration of caregiving and personal growth was specified. The model provided an acceptable fit to the data ($df = 175$, $\chi^2 = 370.75$; $P = 0.00$; RMSEA = 0.05; GFI = 0.91; CFI = 0.97). As illustrated in Fig. 1, predictors of initial status in personal growth confirmed the finding of Study 1 that greater lack of social acknowledgment was more likely to be associated with more personal growth initially ($\beta = 0.26$; $t = 3.35$). Additionally, caregiving tasks were also related with personal growth through caregiving at Time 1 ($\beta = 0.41$; $t = 5.85$), and the longitudinal impact of changes in caregiving tasks appeared in this model. As caregiving tasks increased over time, caregivers' personal growth also increased ($\beta = 0.42$; $t = 2.86$). An interesting finding was that after caregiving tasks were controlled for, the duration of caregiving was no longer associated with personal growth, indicating that caregiving tasks had a mediator effect. Caregiving tasks by themselves were predicted by long duration of caregiving ($\beta = 0.30$; $t = 4.90$). The negative sign between duration and changes in caregiving tasks ($\beta = -0.27$; $t = -3.77$) and between duration and loss and grief ($\beta = -0.25$; $t = -2.73$) possibly indicates that changes are more pronounced at an early stage of the caregiving process. Age was investigated as a control variable and showed significant relationships with loss and

Fig. 1 Change in personal growth through caregiving. $\chi^2(175) = 370.75$, $P = 0.00$, RMSEA = 0.05, GFI = 0.91, NNFI = 0.96, CFI = 0.97. The values are significant, standardized path coefficients (see text for further explanation). *PersGrowth* Personal growth through caregiving, *Badl/Iadl* caregiving tasks, *Loss/Grief* loss and grief, *LackSocial* lack of social acknowledgment, *RestrNeeds* restrictions in personal needs, *Duration* duration of caregiving

grief at Time 1 ($\beta = 0.30$; $t = 4.82$) and lack of social acknowledgment ($\beta = -0.21$; $t = -3.31$).

General discussion

In the present studies, we pursued two main research goals. First, we examined relationships between personal growth and care-related stressors. Second, we investigated the development of personal growth over time. We proposed that care-specific crises and demands have the potential to activate domains of cognitive maturity (termed cognitive complexity and personal growth through caregiving). Study 1 and Study 2 supported this assumption.

A longer duration of caregiving was associated with higher cognitive complexity and with more personal growth through caregiving (“Study 1”). In Study 2, there was a mean increase in personal growth through caregiving. An explanation for the relation between caregiving duration and personal growth might be that long-term caregivers were often and intensely confronted with patient’s deficits. Dementias in old age usually show a gradual process of mental and physical deterioration, ultimately leading to a severely debilitated state. Possible explanations for our results center on care-specific changes and the extent to which caregivers reflect about their situation. Long-term caregivers probably often reflect on the patients’ progressing deficits and restrictions; this reflection could possibly lead to deeper and more complex insight into self and life.

Although correlative in nature, our data indicate that this increased cognitive maturity is not a mere effect of passing time, but rather related to care-specific demands. First, the absence of any possible age correlation (in contrast to the results of Ryff 1989) can be interpreted as supporting

the argument that cognitive maturity requires critical life events, crises, or demands. Second, in Study 2, the relationship between duration of caregiving and personal growth through caregiving was mediated by caregiving tasks. This positive relationship is similar to the findings of Robertson et al. (2003). Using similar instruments, Robertson and colleagues have demonstrated that the more help needed (in activities with daily living), the greater the gain reported by the caregiver was. In addition, our results demonstrate longitudinal effects: Increases in personal growth through caregiving were found to be predicted by increased caregiving tasks.

At the correlative level of analysis, many caregiving tasks were associated with higher personal growth through caregiving. Although some of these relations lie go beyond the conventional significance level, when further covariates are added into the analyses, lack of social acknowledgment and caregiving tasks showed the strongest correlations. The correlation between lack of social acknowledgment and personal growth through caregiving in both studies allows several interpretations. One might argue that a lack of social acknowledgment represents a social problem. Because of their high relevance for one's self-definition and emotional valence (Hormuth 1990; Mickler 2004), social problems in particular have been considered to have a strong impact on the development of mature thinking. A possible explanation can be found in the results of Leipold et al. (2004) in the correlation with ruminative and intrusive thoughts. Rumination acts as a trigger for life reflection (Staudinger 2001), which can lead to new insights into one's life.

On the other hand, one could argue that the lack of social acknowledgment could possibly lead to an increase in personal growth through caregiving by producing uncomfortable feelings of tension. According to Festinger (1954) theory of cognitive dissonance, one might expect that two conflicting thoughts (importance of the caregiver role, lack of social acknowledgment) produce a tension that can be released by adding new cognitions (personal growth through caregiving).

Restrictions in personal needs and loss and grief (e.g., patient's loss of personality, cognitive decline) showed no unique contribution to personal growth through caregiving when further covariates were added into the analyses. The study by Leipold et al. (2004) showed that these restrictions were related to escapist thoughts (a form of reminiscence in which people think and "live" in the past, a situation that possibly impedes effectiveness in dealing with and thinking about present demands).

Finally, this study raises the question of how to measure cognitive maturity. Similar to other fields with a strong evaluative component, there is little agreement on

how to assess maturity. Personal growth through caregiving and cognitive complexity are only two examples of a variety of methods. In principle, the different methods and concepts can be distinguished along two dimensions, in effect which perspective has been taken: (a) self-evaluation by the participant and (b) judgment made by the coder. These seem to have more differences than similarities on a correlative basis. Furthermore, crystallized intelligence was related negatively to self-evaluation of personal growth through caregiving but positively to cognitive complexity. One interpretation could be that people with lower crystallized abilities tend to report more personal growth whereas people with higher cognitive abilities tend to be more sceptical in such evaluations. More important, both indicators of mature thinking do correlate significantly after crystallized intelligence is controlled for; however, we are in need of further studies that critically analyze the differences and commonalities of maturity indicators, which, except for Likert-Scales, are rather time-consuming and because of their uniqueness difficult to validate.

As to the normative consequences of qualifying coping endeavors as mature, we have discussed the rather functional role of mature thinking in the stress-coping process. This is only one criterion, however. Under unfavorable conditions, unpleasant and inconvenient thoughts can be organized in a complex way, thus making complexity a risk factor for depression.

The conclusions in this paper, however, must be tempered with caution because of several missing links. We assume that critical life events or caregiving demands can result in mature thinking when cognitive processes such as rumination and life reflection are triggered. But obviously, not all demands are related to personal growth through caregiving or cognitive complexity. We need to further investigate the characteristics of persons as well as of crises, stress, and demands that lead to critical reflection. In addition, our results are based on correlations. Without experimental control, causal inferences are not justified.

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Appendix

See Table 3.

Table 3 Correlations between care variables per assessment point

	Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Pers.Gr	1																			
2	Pers.Gr		1																		
3	Pers.Gr.			1																	
4	Pers.Gr.				1																
5	Badl/fadl					1															
6	Badl/fadl						1														
7	Badl/fadl							1													
8	Badl/fadl								1												
9	Loss									1											
10	Loss										1										
11	Loss											1									
12	Loss												1								
13	Soc													1							
14	Soc														1						
15	Soc															1					
16	Soc																1				
17	Restr																	1			
18	Restr																		1		
19	Restr																			1	
20	Restr																				1
21	Age																				
22	Gender																				
23	Duration																				

Pers.Gr., Personal growth through caregiving; Badl/fadl, caregiving tasks; Loss, loss and grief; Soc, lack of social acknowledgment; Restr, restrictions in personal needs; Duration duration of caregiving

$r > 0.11 = P < 0.05$; $r > 0.15 = P < 0.01$

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