

Regret and Quality of Life Across the Adult Life Span: The Influence of Disengagement and Available Future Goals

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Two studies examined the associations between life regrets and indicators of quality of life across the adult life span. Given that opportunities to undo regrets decline with age, regret intensity was expected to be inversely associated with subjective well-being and health among older adults. In addition, the research explored protective factors that have the potential to reduce older adults' regret intensity. It was suggested that being disengaged from undoing the consequences of regrets and having many future goals available may reduce older adults' intensity of regret and thereby contribute to a better quality of life. Across both studies, the findings demonstrate that older adults perceived reduced opportunities to undo the consequences of their regrets and that regret intensity predicted a reduced quality of life only among older adults. Furthermore, the findings support the adaptive value of disengagement and available future goals for managing life regrets in older adults.

Keywords: regret, well-being, health, self-regulation, goal adjustment

Regret is a commonly experienced phenomenon that can instigate high levels of psychological distress (Landman, 1987; Lecci, Okun, & Karoly, 1994). In this article, we further qualify the effects of regret experiences on broader indicators of quality of life (i.e., global well-being and health).¹ Our first aim was to examine age differences in the relation between the intensity of severe regrets and indicators of quality of life. Based on the assumption that opportunities to undo the negative consequences of regretted behaviors decline with age, we expected that individual differences in regret intensity can compromise subjective well-being and health only among older adults. In addition, we explored factors that may prevent older adults from experiencing intense regret and a reduced quality of life. On the basis of self-regulation theories, we examined whether being disengaged from undoing the negative consequences of regrets and having many future goals available may alleviate regret intensity and contribute to older adults' quality of life.

Regret and Quality of Life Across the Adult Life Span

Throughout life, people are faced with the challenge of making adaptive decisions with respect to the pursuit of personal goals (Carver & Scheier, 1998; Emmons, 1985). These decisions channel people's lives into specific biographical tracks (Schulz &

Heckhausen, 1996). However, sometimes people may recognize that a chosen developmental pathway does not fit their current needs, values, or desires, or they may realize that a desired goal has not been pursued successfully. In such situations, individuals may reflect on their lives (Staudinger, 2001; Wong & Watt, 1991) and begin to regret having or not having pursued a specific path (for differences between omissions and commissions, see Gilovich & Medvec, 1995). For example, a person who is experiencing a divorce may regret having had an extramarital affair, or a person who is dissatisfied with his or her occupation may regret not having pursued a better education.

Severe life regrets involve the experience of counterfactual thoughts (e.g., "What would have happened, if . . ."; Kahneman, 1995; Roese, 1997) and specific emotions (e.g., anger or desperation; Gilovich, Medvec, & Kahneman, 1998) frequently associated with major developmental domains such as work and family (Wrosch & Heckhausen, 2002). Although the emotional and cognitive concomitants of severe regrets have been shown to affect broader aspects of a person's subjective well-being, surprisingly little is known about age differences in the associations between regret and subjective well-being (see Lecci et al., 1994). The lack of research on the effects of regret in different age groups may be attributed to a tendency to assume that these processes occur predominantly in late midlife and old age (Butler, 1963). However, research shows that people reflect on their lives throughout the entire adult life span (Staudinger, 2001; Webster & McCall, 1999), suggesting that it may be important to qualify the experience of life regrets by age.

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¹ In this article, we refer to individual differences in subjective well-being and health as quality of life indicators. Although quality of life has been conceptualized in many different ways, subjective well-being and physical health aspects have generally been described as the core aspects of quality of life (Cummins, 1996).

In addition, there are theoretical reasons to assume that age can influence the consequences of regret experiences on a person's quality of life. Theories have postulated that the adult life span is characterized by an age-differential structure that usually involves decreased opportunities for successful goal pursuits in older age (Baltes & Baltes, 1990; Heckhausen & Schulz, 1995). The reduced opportunities to realize personal goals in old age have been attributed to age-related declines in personal resources, increases in societal constraints, a lack of remaining life time, and age norms regulating appropriate behaviors (Baltes, Reese, & Nesselrode, 1988; Carstensen, Isaacowitz, & Charles, 1999; Heckhausen, 1999). These factors can influence a person's opportunities for undoing regrets, and it should become more difficult to actively overcome the consequences of a regretted behavior as a person advances in age (Wrosch & Heckhausen, 2002).

An implication of this argument is that age may constitute a moderator between the intensity of severe life regrets and broader indicators of quality of life. Other things being equal, an intense regret may result in heightened feelings of helplessness and depression particularly in later adulthood because an older person is not able to undo the regret (see Abramson, Seligman, & Teasdale, 1978; Brown & Siegel, 1988, for the association between uncontrollable events and depression). Furthermore, depressive symptomatology may affect an older person's physical health through its negative motivational, behavioral, and biological consequences (Schulz, Martire, Beach, & Scheier, 2000; Wrosch, Schulz, & Heckhausen, 2004). By contrast, the effects of regret on a younger person's subjective well-being and health may be negligible, given the more favorable opportunities to overcome the regretted behavior. A younger person might remain more optimistic about the possibility of overcoming a severe regret in the future. Even though preliminary evidence supports this argument by suggesting that the number of life regrets can be associated with low life satisfaction among adults in late midlife but not among younger adults, this finding remains inconclusive because age-differential associations between life regrets and life satisfaction do not generalize to other quality of life indicators (e.g., depression; Lecci et al., 1994).

Considering the potential consequences of severe regrets on older adults' quality of life, it is also relevant to identify factors that can reduce the experience of intense regret among older adults. In this regard, self-regulation theories (Carver & Scheier, 1990, 1998) provide a tool that can be used to examine how people can manage their life regrets. From this perspective, intense regret may be experienced as a function of a discrepancy between an actual state and a person's belief that the consequences of a regretted behavior would be undone if the person had behaved differently in the past (e.g., "If I had it to do over again . . ."; Stewart & Vandewater, 1999). Such consequences of a regretted behavior are reflected in undesired concrete life circumstances, which may also influence emotional states. For example, a woman who did not have children early in life may experience the consequences of this decision later in life, when she recognizes that her life lacks important aspects (e.g., caring about the next generation or sharing family history). In turn, she may also feel sad and think that she would be much better off if she had a child and may begin to regret her past behavior.

In addition, self-regulation theories predict that the intensity of regret can be alleviated if a person engages in adaptive behaviors.

In this regard, it has been proposed that older adults may benefit from adjusting internally to a regretted behavior by changing their perceptions about regrets and accepting that a regretted behavior cannot be undone (Wrosch & Heckhausen, 2002). This line of argument is consistent with a recently proposed model of adaptive goal disengagement, which assumes that few opportunities to realize an important objective (such as undoing a regret) should motivate a person to withdraw effort and commitment from the pursuit of this objective (Wrosch, Scheier, Carver, & Schulz, 2003; Wrosch, Scheier, Miller, Schulz, & Carver, 2003). By disengaging, the person can avoid the experience of negative psychological states associated with the inability to reach a desired goal and may free resources that can be used to achieve other important objectives (for beneficial effects of goal disengagement, see also Klinger, 1975; Moskowitz, Folkman, Collette, & Vittinghoff, 1996; Nesse, 2000; Scheier & Carver, 2001; Tunali & Power, 1993). Thus, disengagement may be an adaptive factor that can reduce older adults' intensity of regret. By contrast, older adults who are committed to undoing the consequences of a regretted behavior may not make progress toward accomplishing this objective and therefore may experience intense regret. Furthermore, disengagement may contribute to older adults' subjective well-being and physical health by reducing the experience of intense regret.

Another factor that may be associated with older adults' intensity of regret is the capacity to identify and pursue alternative goals. Having alternative goals available may reduce an older person's focus on regrets that cannot be overcome and may thereby alleviate the intensity of regret. As a consequence, older adults' subjective well-being may also benefit from their capacities to identify meaningful goals. In fact, research has pointed to the beneficial effects of available alternatives on adaptive goal regulation and subjective well-being (Aspinwall & Richter, 1999; Duke, Leventhal, Brownlee, & Leventhal, 2002; Gollwitzer, Heckhausen, & Steller, 1990; Linville, 1987; Wrosch, Scheier, Miller, et al., 2003), although associations between alternative goals and regret experiences have not yet been examined.

It is important to note that disengagement and available future goals may not be associated with regret intensity and indicators of quality of life in young adulthood. For example, younger adults who stay committed to undoing their regrets may not necessarily experience elevated levels of regret intensity and reduced levels of subjective well-being, given that they possess favorable opportunities to overcome their regrets or can keep being optimistic about undoing the regret in the future. In support of this argument, research has shown that processes directed at overcoming regrets (i.e., holding an internal control attribution; Wrosch & Heckhausen, 2002) can be associated with reduced regret intensity among young adults. In addition, age-differential adjustment processes are also evidenced by research that examines more general goal regulation tendencies, suggesting that an increased use of processes that support goal disengagement is associated with subjective well-being among older adults (e.g., Wrosch, Heckhausen, & Lachman, 2000).

In addition, the availability of purposeful goals may be less compromised in young adulthood, because the environmental context provides a younger person with plentiful options to pursue in the future. Because an age-normative timetable of developmental tasks keeps young adults engaged in various activities (e.g., Havi-

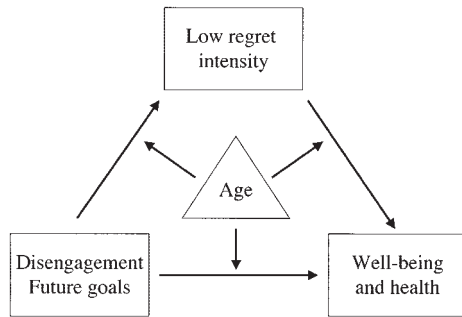


Figure 1. Theoretical model of the associations between age, self-regulation of regret, regret intensity, and well-being and health.

ghurst, 1967), young adults who have difficulty with identifying new goals may still remain engaged in the pursuit of developmental tasks and not necessarily focus on their life regrets. Thus, individual differences in people's capacities to identify meaningful future goals may be less influential in younger as compared to older adults (Wrosch & Freund, 2001; for research on purpose in life, see also Ryff & Keyes, 1995), and failure to explicitly identify future goals may not be associated with intense regret experiences and compromised well-being in young adulthood.

In sum, we suggest that disengagement and available future goals are adaptive self-regulation factors that become increasingly associated with low regret intensity as people advance in age. By alleviating the intensity of regret, disengagement and available future goals may further contribute to older adults' subjective well-being and physical health.

Present Research

The conceptual model guiding our hypotheses of functional associations between variables is depicted in Figure 1. The primary goal of the two reported studies was to provide evidence for the moderating role of age in the associations between self-regulation of severe life regrets (disengagement and future goals), regret intensity, and indicators of quality of life (subjective well-being and health). The second main objective was to evaluate the mediating role of regret intensity in the relation between self-regulation of regrets and indicators of quality of life among older adults. In addition, we explored whether age differences in the opportunities to undo regrets could explain the age effects of regret intensity on indicators of quality of life. We note that both studies also distinguished between omissions and commissions to explore the relative influence of both types of regret, although we did not formulate a priori hypotheses about differences between omissions and commissions.

Study 1 examined groups of young and older adults. We expected that older, as compared with younger, adults would experience fewer opportunities to undo their regrets and would be more fully disengaged from undoing their regrets. In addition, we hypothesized that experiences of intense regret would predict depressive symptoms and health problems among older adults but not among younger adults (see Figure 1). We further explored whether age differences in the opportunities to undo regrets might statistically explain the age effects of regret intensity on indicators of

quality of life. Moreover, we expected that disengagement from undoing regrets would be associated with a low intensity of regret and low levels of depressive symptoms and health problems among older adults but not among young adults (see Figure 1).² Finally, we examined, only among older adults, whether the effects of disengagement on depressive symptoms and health problems could be explained by regret intensity and whether the effect of regret intensity on physical health could be explained by depressive symptoms.

Study 2 examined a sample of young, middle-aged, and older adults. We attempted to replicate the age differences in perceived opportunities to undo the consequences of regrets and the age-differential effects of regret intensity on indicators of quality of life by predicting life satisfaction. The effects for middle-aged adults were expected to be between those of young and older adults. In addition, we examined the role played by available future goals in the self-regulation of life regrets. We hypothesized that the availability of future goals would predict low regret intensity and high levels of life satisfaction among older adults but not among young adults. Finally, we examined, only among older adults, whether the effects of available future goals on life satisfaction would be mediated by the intensity of regret.

Study 1

Method

Participants

The participants were 120 adults from the Montreal area who participated in a questionnaire study. Sixty-two participants were young adults (19–35 years, $M = 22.47$, $SD = 2.91$), and 58 participants were older adults (55–89 years, $M = 69.67$, $SD = 7.78$). Fifty-six percent of the sample was female, and 46% of the sample received a higher education (undergraduate university degree or more). The distribution of men and women did not differ across the two age groups. However, older adults had received more education (67% highly educated) than young adults (26% highly educated), $\chi^2(1) = 20.72$, $p < .01$. The group of young adults was recruited at Concordia University. The group of older adults consisted of a community sample of adults who had previously participated in an unrelated study. All participants received \$10.

Materials

The questionnaire included measures of aspects of participants' life regrets, namely the intensity of their regrets, the extent to which they perceived opportunities to undo the consequences of their regrets, and the extent to which they were disengaged from undoing the consequences of their regrets. We also measured depressive symptoms and physical health problems as indicators of quality of life. Participants were instructed to report their most severe commission and omission regret. The sequence of questions concerning commission and omission regrets was counterbalanced across the sample. Of the 120 participants, 116 individuals reported having either a commission or an omission regret and were included in the

² We note that our theoretical rationale would also allow to us to test three-way interactions examining whether quality of life is compromised among participants who experience intense regret, have only few opportunities to undo the regret, but are still committed to overcome the regret. Given the sample sizes of our studies and conceptual associations between variables, we could not test these assumptions in the reported research.

analyses.³ Similar to previously published work (see Wrosch & Heckhausen, 2002), the majority of reported regrets were associated with family/partnership-related issues (35%; e.g., not having had children) and work/educational issues (23%; e.g., not going to Oxford). The occurrence of life regrets in these domains was unrelated with participants' age group.

We assessed intensity of regret by asking the participants to report their levels of negative affect and intrusive thoughts associated with the experience of the reported commission and omission regrets. With respect to negative affect, we asked the participants to report the extent to which they experienced each of six emotions during the past few months when they thought about their regrets. Each emotion was rated on a 5-point Likert-type scale (1 = *very slightly or not at all*, 5 = *extremely*). The six emotions were selected on the basis of Gilovich and colleagues' work (Gilovich et al., 1998); the emotions were angry, irritated, embarrassed, helpless, desperate, and sorrow. Although Gilovich et al. (1998) divided these emotions into categories of hot emotions (e.g., angry) and despair-related emotions (e.g., helpless), previous work has demonstrated that hot and despair-related emotions are highly correlated and show comparable patterns of predictive relations (Wrosch & Heckhausen, 2002). By aggregating the six emotions, we obtained scales for negative affect concerning regretted commissions ($M = 2.22$, $SD = .86$, $\alpha = .81$) and omissions ($M = 2.03$, $SD = .86$, $\alpha = .83$).⁴

We also developed a new measure of intrusive thoughts about life regrets. The items were adapted from a generic scale that measures people's tendencies to experience intrusive thoughts about problems (Wrosch & Heckhausen, 2002). Participants were asked to indicate how frequently they experienced each of five situations during the past few months. The situations included "I had difficulty concentrating on my work or daily activities because thoughts about the regret kept entering my mind," "I woke up at night thinking about the regret," "Thoughts about the regret interfered with my abilities to enjoy social or leisure activities," "I had trouble falling asleep because I couldn't stop thinking about the regret," and "Once I start thinking about the regret I find it hard to think about (focus my attention on) other things." These situations were rated on 4-point Likert-type scales (1 = *not at all*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*). By aggregating the five items, we obtained scales of intrusive thoughts about regretted commissions ($M = 1.90$, $SD = .76$, $\alpha = .83$) and omissions ($M = 1.77$, $SD = .71$, $\alpha = .82$).

To examine whether the measures of negative affect and intrusive thoughts represent empirically distinct constructs, we conducted two separate exploratory principal component factor analyses (using varimax rotation) for participants' commission and omission regrets. For both types of regret, a two-factor solution emerged with eigenvalues higher than 1.0. We found that the items of intrusive thoughts and negative affect loaded on separate factors, explaining 56% of the variance in participants' commission regrets (negative affect: eigenvalue = 4.50, loadings = .57 to .82; intrusive thoughts: eigenvalue = 1.69, loadings = .72 to .78) and 59% of the variance in participants' omission regrets (intrusive thoughts: eigenvalue = 4.94, loadings = .55 to .81; negative affect: eigenvalue = 1.59, loadings = .41 to .79).

We measured opportunities to undo the consequences of regrets for omissions and commissions by asking the participants to report how likely it is that the negative consequences of the regrets can (Item 1) and will (Item 2) be undone. These responses were rated on 5-point Likert-type scales (1 = *very unlikely*, 5 = *very likely*). For both types of regrets, the two items were highly correlated (commissions: $r = .77$, $p < .01$; omissions: $r = .73$, $p < .01$) and were therefore aggregated to obtain measures of perceived opportunities to undo commission ($M = 2.34$, $SD = 1.39$) and omission regrets separately ($M = 2.33$, $SD = 1.37$).

Disengagement. To obtain indicators of individual differences in disengagement from undoing commission and omission regrets, we asked the participants to report how much effort they invest in undoing the negative consequences of their reported regrets. In addition, we asked the participants to report how strongly they are committed to undoing the negative

consequences of their reported regrets. The items were assessed with 5-point Likert-type scales (1 = *not at all*, 5 = *very much*). For both types of regret, the two items were highly correlated (commissions: $r = .81$, $p < .01$; omissions: $r = .90$, $p < .01$). The items were reverse coded and aggregated separately for commission regrets ($M = 3.20$, $SD = 1.38$) and omission regrets ($M = 3.19$, $SD = 1.41$). A high score on the scales indicated that participants were more fully disengaged from undoing the negative consequences of their life regrets.

Depressive symptomatology was assessed via a 10-item version of the Center for Epidemiologic Studies Depression Scale (Andresen, Malmgren, Carter, & Patrick, 1994). Participants were asked to indicate how often each statement applied to them during the past week on a 4-point scale (0 = *rarely or none of the time*, 3 = *most or almost all of the time*). Sample items included "I was bothered by things that usually don't bother me" or "I felt lonely." To obtain a measure of depressive symptomatology, we computed the sum score of the 10 items ($M = 7.01$, $SD = 5.22$, $\alpha = .80$).

Physical health problems. We administered a checklist that included seven physical health problems. The items were selected from a checklist that was previously used in a large U.S. national probability sample (MIDUS; e.g., Wrosch et al., 2000). The seven symptoms were selected because they were expected to be affected by psychological distress and could be experienced by both young and older adults. Participants were asked to report whether they had experienced or had been treated for any of the following health problems during the previous 12 months: (a) persistent skin trouble (e.g., eczema); (b) recurring stomach trouble, indigestion, or diarrhea; (c) constipation all or most of the time; (d) chronic sleeping problems; (e) migraine headaches; (f) asthma, bronchitis, or emphysema; and (g) thyroid disease. If the participants had experienced or had been treated for a specific health symptom, they received a score of 1 for the specific symptom. We computed a count variable indicating the number of physical health problems (range = 0–5, $M = .90$, $SD = 1.08$).

Results

The Results section is divided into two parts. The first section reports analyses that tested the hypothesized age differences in mean levels of disengagement and opportunities to undo the consequences of regrets, and age-differential relations between disengagement, intensity of regret, and indicators of quality of life. The second section presents analyses that examined the hypothesized pathways toward maintaining high levels of subjective well-being and physical health among older adults.

Age Effects

We suggested that older adults would perceive fewer opportunities to undo the consequences of their regrets than younger adults. In addition, we predicted that older adults would generally be more fully disengaged from undoing their regrets than young adults. To examine these hypotheses, we conducted four analyses

³ Six participants reported having no commission regret but an omission regret (two young adults), and seven participants reported having no omission regret but a commission regret (three young adults). Because we attempted to include as many participants as possible into the analyses, we conducted separate analyses for commission and omission regrets (commissions: $n = 110$; omissions: $n = 109$).

⁴ Gilovich et al. (1998) measured wistful emotions as another dimension of regret experiences. We did not include these emotions into our study, because previous work showed that they are not associated with a person's reported regret intensity (Wrosch & Heckhausen, 2002).

of variance (ANOVAs)⁵ using perceived opportunities for undoing commission and omission regrets, and disengagement from undoing commission and omission regrets as dependent variables. Age group represented an independent group factor, and sex and educational level were entered as covariates into the analyses. The results showed no significant effects for the covariates. In support of our hypotheses, we found significant effects of age group on opportunities for undoing commission regrets, $F(1, 106) = 6.10$, $p = .01$, $\eta^2 = .05$, and omission regrets, $F(1, 105) = 14.93$, $p < .01$, $\eta^2 = .12$. As predicted, older adults reported fewer opportunities for undoing the consequences of commission regrets ($M = 1.94$, $SD = 1.26$) and omission regrets ($M = 1.76$, $SD = 1.10$) in comparison to young adults (commissions: $M = 2.67$, $SD = 1.41$; omissions: $M = 2.80$, $SD = 1.41$). In addition, we found a significant age group effect on disengagement from commission regrets, $F(1, 104) = 8.39$, $p \leq .01$, $\eta^2 = .07$. Older adults reported higher levels of disengagement from commission regrets ($M = 3.59$, $SD = 1.35$) than young adults ($M = 2.88$, $SD = 1.36$). Supplementary analyses showed that high opportunities to undo the consequences of regrets were associated with low disengagement scores ($r_s = -.47$ to $-.50$, $p_s < .01$), and the age differences in the levels of disengagement were rendered nonsignificant if perceived opportunities were taken into account.

We examined our main hypothesis about age-differential effects of the components of regret intensity (negative affect and intrusive thoughts) on depressive symptoms and health problems by conducting four hierarchical multiple regression analyses predicting depressive symptoms and health problems separately for regretted commissions and omissions. Sex and educational level were entered as control variables in the first step of the analyses. In the second step, the main effects of age group, intrusive thoughts, and negative affect were entered into the regression equations. In the third step, we tested the interaction terms between age group and negative affect, and between age group and intrusive thoughts separately for significance. Predictor variables were centered in all regression analyses.

The analyses of the control variables showed a significant effect of sex on reported health problems, $F(1, 107) = 5.61$, $\beta_s = -.22$, $p < .05$, $R^2 = .05$, suggesting that men reported fewer health problems than women. The results of the main effects and interaction effects are reported in Table 1. Age group predicted depressive symptomatology, $F(1, 104) = 5.28$, indicating that older adults reported lower depression scores than young adults. In addition, we found significant main effects of intrusive thoughts about regretted commissions, $F(1, 104) = 7.16$, and omissions, $F(1, 102) = 13.65$, predicting elevated levels of depressive symptoms. There were no main effects for predicting health problems.

Most important, the results of the final step of the analyses demonstrated that six of the eight tested interaction effects between age group and the components of regret intensity (negative affect and intrusive thoughts) were significant. As reported in Table 1, intrusive thoughts $F(1, 103) = 3.84$, and negative affect, $F(1, 103) = 8.28$, associated with commission regrets showed significant interactions with age group in predicting depressive symptoms. In addition, the interactions between age group and intrusive thoughts $F(1, 103) = 6.18$, and age group and negative affect, $F(1, 103) = 8.16$, associated with commission regrets significantly predicted participants' health problems. Finally, the interactions between age group and negative affect associated with

Table 1
Hierarchical Regression Analysis Predicting Depressive Symptoms and Health Problems by Age Group. Intensity of Regret (Intrusive Thoughts and Negative Affect), and the Interactions between Age Group and Intensity of Regret Separately for Commission and Omission Regrets

Predictors ^a	Depressive symptoms		Health problems	
	R^2	β^b	R^2	β^b
	Commissions			
Age group	.04*	-.24*	.00	.06
Intrusive thoughts	.06**	.28**	.00	.08
Negative affect	.02	-.05	.02	.15
Age group \times intrusive thoughts	.03*	.17*	.05**	.23**
Age group \times negative affect	.06**	.25**	.07**	.26**
	Omissions			
Age group	.05**	-.26**	.00	.05
Intrusive thoughts	.09**	.38**	.03	.20
Negative affect	.01	.10	.00	.04
Age group \times intrusive thoughts	.01	.10	.01	.08
Age group \times negative affect	.02*	.16*	.03*	.19*

^a The analyses are controlled for sex and educational level. ^b Betas represent unique effects in each step of analyses.

* $p \leq .05$. ** $p \leq .01$.

omission regrets significantly predicted participants' depressive symptoms, $F(1, 101) = 3.78$, and health problems, $F(1, 102) = 4.13$.

To further explore the significant interaction effects, we estimated the simple slopes between regret intensity and indicators of quality of life separately for young and older adults (Aiken & West, 1991). In support of our hypotheses, the analyses demonstrated that intrusive thoughts about commission regrets were positively associated with depressive symptoms ($\beta = .48$, $p < .01$) and health problems ($\beta = .35$, $p < .05$) among older adults but not among young adults (depression: $\beta = .13$, $p > .05$; health problems: $\beta = -.13$, $p > .05$). We also found, among older adults, positive associations between negative affect associated with commission regrets and health problems ($\beta = .41$, $p < .01$) and depressive symptoms ($\beta = .20$, $p > .05$), although the latter association was not significant. Among younger adults, negative affect associated with commission regrets did not predict participants' health problems ($\beta = -.11$, $p > .05$) and was negatively associated with depressive symptoms ($\beta = -.30$, $p < .05$), indicating that regret may contribute to younger adults' quality of life under some circumstances.

A similar pattern of results was found for participants' omissions. Regret-specific negative affect was positively associated with depressive symptom ($\beta = .27$, $p < .05$) and health problems ($\beta = .24$, $p = .10$) among older adults but not among young adults

⁵ We obtained missing data with respect to depressive symptoms (1), intrusive thoughts about commissions (2) and omissions (1), negative affect associated with commissions (3) and omissions (2), and disengagement from commissions (2) and omissions (2). Across both studies, missing data of predictor variables were replaced with the mean value of the sample in the respective analyses. We did not replace missing data of dependent variables in the analyses.

(depression: $\beta = -.04, p > .05$; health problems: $\beta = -.13, p > .05$). These results support our main hypothesis by demonstrating stronger associations between regret intensity and high levels of depressive symptoms and health problems among older as compared to younger adults.

To examine whether the age effects of regret intensity on depressive symptoms and health can be statistically explained by participants' perceived opportunities, we repeated the previously reported analyses and additionally controlled the results for participants' perceived opportunities (and the interactions between perceived opportunities and the two components of regret intensity, and perceived opportunities and age group). With respect to participants' omission regrets, the results showed that the two interactions between regret-related negative affect and age group in predicting health problems and depressive symptoms were rendered nonsignificant, after we accounted for participants' perceived opportunities. However, the findings also showed that all of the four interactions between age group and the intensity of commission regrets remained significant, if the covariates were taken into account.

We also hypothesized that individual differences in disengagement would predict successful adaptation to the experience of life regrets, particularly among older adults. To statistically test this hypothesis, we performed separate regression analyses for omission and commission regrets. We predicted depressive symptoms, health problems, and each component of regret intensity by the interaction term between age group and disengagement. We controlled for sex, educational level, and the main effects in previous steps of the analyses.

The effects of the control variables on depressive symptoms and health symptoms were similar to the results of the previously reported analyses, and no effects of the control variables on the components of regret intensity were observed. The results of the main effects and interactions are reported in Table 2. With respect to regret intensity, age group significantly predicted intrusive thoughts about commission regrets, $F(1, 103) = 7.86$. Older adults reported lower levels of intrusive thoughts about their regretted

commissions than young adults. Identical to the previously reported analyses, age group predicted reduced levels of depressive symptoms. In addition, we obtained significant main effects of disengagement from undoing commission and omission regrets in predicting low values across both indicators of the intensity of regret, $F_s > 6.30$. We also found significant main effects of disengagement from undoing commissions, $F(1, 105) = 5.36$, and omissions, $F(1, 104) = 8.12$, in predicting low levels of health problems. Moreover, the main effect of disengagement from undoing omissions predicted low levels of depressive symptoms, $F(1, 103) = 4.16$.

The final step of the analyses revealed two significant interaction effects (see Table 2). We found significant interaction effects between age group and disengagement from undoing commission regrets on depressive symptoms, $F(1, 104) = 3.80$, and health problems, $F(1, 104) = 4.13$. To further examine the significant interactions, we estimated the simple slopes for young and older adults separately (Aiken & West, 1991). The analyses confirmed that disengagement from undoing commission regrets was associated with lower levels of depressive symptoms ($\beta = -.30, p < .05$) and lower levels of health problems ($\beta = -.44, p < .01$) among older adults but not among young adults (depression: $\beta = -.04, p > .05$; health problems: $\beta = -.13, p > .05$).

Pathways to Well-Being and Health in Old Age

We hypothesized that the association between older adults' regret intensity and their health problems might be mediated by depressive symptomatology. We further suggested that the effects of failed disengagement on regret intensity might contribute to older adults' depressive symptoms and health problems. Our previously reported results provide initial support for these possibilities by showing that the associations between regret intensity, failed disengagement, and depression and health problems are stronger among older adults as compared with young adults. To statistically evaluate these hypothesized pathways more comprehensively, we conducted two sets of mediation analyses exclu-

Table 2
Hierarchical Regression Analyses Predicting the Components of Regret Intensity (Intrusive Thoughts and Negative Affect), Depressive Symptoms, and Health Problems by Age Group, Disengagement, and the Interactions between Age Group and Disengagement Separately for Participants' Commission and Omission Regrets

Predictors ^a	Components of regret intensity				Depressive symptoms		Health problems	
	Intrusive thoughts		Negative affect		<i>R</i> ²	β^b	<i>R</i> ²	β^b
	<i>R</i> ²	β^b	<i>R</i> ²	β^b				
	Commissions							
Age group	.06**	-.28**	.00	.00	.07**	-.31**	.00	.08
Disengagement	.07**	-.28**	.22**	-.49**	.01	-.10	.04*	-.22*
Age group × disengagement	.00	-.02	.00	-.04	.03*	-.17*	.03*	-.18*
	Omissions							
Age group	.03	-.18	.01	-.11	.09**	-.33**	.01	.04
Disengagement	.13**	-.37**	.09**	-.30**	.03*	-.19*	.07**	-.26**
Age group × disengagement	.00	.00	.01	.08	.00	-.05	.00	-.02

^a The analyses were controlled for sex, educational level, and type of regret. ^b Betas represent unique effects in each step of analyses.
* $p \leq .05$. ** $p \leq .01$.

sively with the group of older adults. All analyses were controlled for sex and educational level.

The first set of mediation analyses examined whether the associations between older adults' intensity of regret and health problems were mediated by depressive symptomatology. We first calculated the simple effects of the indicators of regret intensity and depressive symptoms on older adults' health problems in separate regression analyses. We then controlled the effects of the indicators of regret intensity and depressive symptoms for each other. Finally, we estimated the significance of the indirect effects by calculating Sobel tests (Baron & Kenny, 1986).

The analyses showed that all four indicators of regret intensity (intrusive thoughts and negative emotions associated with omission and commission regrets: all R^2 s = .11 to .19, all $ps < .01$) and depressive symptoms (all R^2 s = .28 to .29, all $ps < .01$) showed significant simple effects on older adults' physical health problems. However, after controlling the effects of regret intensity and depressive symptomatology for each other in separate analyses, we found that three of the four indicators of regret intensity became statistically unrelated to physical health problems (all R^2 s = .00 to .02, all $ps > .05$), and only negative affect associated with commission regrets still significantly predicted older adults' health problems (all R^2 = .06, all $p < .05$). By contrast, depressive symptomatology was still significantly associated with physical health problems (all R^2 s = .15 to .18, all $ps < .01$) after we controlled for regret intensity. Calculations of the Sobel test confirmed that all four indicators of regret intensity exerted indirect effects on participants' health problems through depressive symptomatology (all Z s > 2.12 , all $ps < .05$).

We conducted the same sequence of analyses to test whether regret intensity would mediate the effects of disengagement on older adults' depressive symptoms and physical health. In these analyses, we used a compound variable as an indicator of regret intensity by entering negative affect and intrusive thoughts as a set of two predictor variables into the regression equations (and an average score of both constructs to calculate the indirect effects). We used compound variables for these analyses to evaluate a common pathway through regret intensity that addresses the variance shared between regret-specific intrusions and negative affect in predicting depressive symptoms and health problems. The use of compound variables also reduced the number of analyses.

The results demonstrated that, among older adults, the simple effects of disengagement from undoing regrets explained significant proportions of variance in depressive symptoms and health problems for both regretted commissions and omissions (all R^2 s $> .08$, all $ps \leq .05$). In addition, the simple effects of the compound of regret intensity explained significant portions of the variance in depressive symptoms and health problems for both regretted commissions and omissions (all R^2 s $> .15$, all $ps < .05$). However, after controlling for the effects of regret intensity, we found that disengagement no longer predicted depressive symptoms and health problems for both regretted commissions and omissions (all $R^2 < .06$, all $ps > .05$). By contrast, most of the indicators of intensity of regret still predicted older adults' depressive symptoms (commissions: $R^2 = .19$, $p = .01$; omissions: $R^2 = .35$, $p < .01$) and health problems (commissions: $R^2 = .10$, $p = .05$; omissions: $R^2 = .10$, $p = .08$), after we controlled for the effects of disengagement. Calculations of the Sobel test showed that disengagement from commission regrets exerted a significant in-

direct effect on depression symptoms ($Z = -2.45$, $p = .01$) and physical health problems ($Z = -2.08$, $p < .05$) through regret intensity. Disengagement from omission regrets also showed a significant indirect effect on depressive symptoms ($Z = -2.17$, $p < .05$). Only the indirect effect of disengagement from omission regrets on physical health problems through regret intensity was not significant ($Z = -1.63$, $p = .10$).

Study 2

We conducted Study 2 to replicate the obtained age effects on opportunities to undo regrets and the age-differential associations between regret intensity and indicators of quality of life. In addition, Study 2 extended the previously reported findings by examining whether the obtained age group effects could be observed as linear age effects in a sample of young, middle-aged, and older adults. Finally, Study 2 incorporated a measure of participants' number of future goals. We expected to find an age-related increase in associations between participants' available future goals and low levels of regret intensity and high levels of life satisfaction.

Method

Participants

The participants were 150 adults from the Montreal area, who participated in a questionnaire study. We obtained an age-heterogeneous sample (range = 18–85 years, $M = 50.06$, $SD = 20.05$) with similar proportions of young (33%, less than 35 years), middle-aged (32%, between 35 and 59 years), and older adults (35%, 60 years and older). Forty-seven percent of the sample was male, and 51% of the sample received a higher education (undergraduate university degree or more). Age, sex, and educational level were statistically unrelated in the obtained sample. Participants were recruited via newspaper advertisements and received \$10 for participating in the study.

Materials

The questionnaire included measures assessing aspects of regret experiences, life satisfaction, and available future goals. In Study 2, the assessment of participants' life regrets was slightly modified. Instead of asking the participants to report both omission and commission regrets, we asked them to report their most severe life regret and to classify whether this regret was one of commission or omission. Of the 150 participants, 133 individuals reported having a regret and were included in the analyses. Sixty percent of the included participants identified their regret as an omission regret, and this was statistically unrelated to age, sex, and educational level. Consistent with Study 1, the majority of reported regrets were associated with family/partnership-related issues (33%; e.g., getting caught in a loveless marriage) and work/educational issues (35%; e.g., wrong career choice); age was statistically unrelated to the experience of regrets in these domains.

Life regrets. To assess the intensity of participants' reported life regrets, we used the same scales measuring negative affect and intrusive thoughts that we had administered in Study 1. The scales of negative affect ($M = 2.47$, $SD = 1.01$, $\alpha = .85$) and intrusive thoughts ($M = 1.88$, $SD = .82$, $\alpha = .90$) associated with life regrets showed acceptable scale characteristics. We also measured participants' perceived opportunities to overcome the negative consequences of their regrets by administering and aggregating the same two items used in Study 1 ($M = 2.38$, $SD = 1.48$).

Life satisfaction was assessed by using a 5-item Likert-type scale (Diener, Emmons, Larsen, & Griffin, 1985). Sample items included "The

conditions of my life are excellent" and "I am satisfied with my life." Satisfaction was rated from 1 = *strongly disagree* to 5 = *strongly agree* ($M = 3.25$, $SD = .90$; $\alpha = .83$).

Available future goals. We measured participants' number of future goals by administering an open-response format questionnaire. We asked the participants to identify and write down up to 10 goals that they intended to pursue over the next 5 years. The content of goals that participants could report was not specified, and 36 participants reported at least one goal that was associated with their reported life regret. Given that our theoretical framework addresses the importance of alternative future goals, we did not consider regret-related goals in the reported analyses, and we computed a count variable representing the number of all other remaining future goals (range = 0–10, $M = 6.01$, $SD = 2.75$).

Results

The Results section is divided into two parts. First, we present analyses that were conducted to examine age effects on opportunities to undo the consequences of regrets and the age-differential relations between available future goals, regret intensity, and life satisfaction. In the second section, we present mediation analyses conducted exclusively with the group of older adults to test whether the association between the number of available future goals and high life satisfaction could be statistically explained by low regret intensity.

Age Effects

To replicate the age effect on perceived opportunities for overcoming regrets, we conducted a hierarchical multiple regression analysis predicting participants' perceived opportunities to undo the consequences of their regrets.⁶ In a first step, we included sex, educational level, and type of regret (omission vs. commission) as control variables into the analyses. In a second step, we tested the main effect of age for significance. Of the control variables, only educational level significantly predicted participants' perceived opportunities to undo regrets, $F(1, 128) = 10.05$, $p < .01$, $R^2 = .07$. Higher educated participants perceived fewer opportunities to overcome their regrets than lower educated participants ($\beta = -.27$). Consistent with the results of Study 1, the analyses confirmed a significant age effect, $F(1, 127) = 5.31$, $p < .05$, $R^2 = .04$. With increasing age, participants reported fewer opportunities to undo the consequences of their regrets ($\beta = -.20$). We further examined whether the obtained age effect (and all the hypothesized effects reported in the following discussion) has to be qualified by the type of regret (omission vs. commission) by testing additional interaction effects involving type of regret for significance. In all of the analyses, the interaction effects involving type of regret were not significant.

We also examined age-differential relations between regret intensity and quality of life by conducting a hierarchical multiple regression analysis predicting participants' life satisfaction scores. In a first step, we included sex, educational level, and type of regret (omission vs. commission) into the analyses. In a second step, we entered the main effects of age, intrusive thoughts, and negative affect associated with regrets into the regression equation. Finally, in a third step, we tested the interaction terms between age and intrusive thoughts, and age and negative affect separately for significance.

The results of the analyses are reported in Table 3. We did not obtain significant effects for the control variables in the first step

Table 3
Hierarchical Regression Analysis Predicting Life Satisfaction by Age, Intensity of Regret (Intrusive Thoughts and Negative Affect), and the Interactions between Age and Intensity of Regret

Predictors ^a	Life satisfaction	
	R^2	β^b
Age	.00	-.04
Intrusive thoughts	.02	-.23
Negative affect	.02	-.24
Age \times intrusive thoughts	.04**	-.21**
Age \times negative affect	.03*	-.16*

^a The analyses were controlled for sex, educational level, and type of regret. ^b Betas represent unique effects in each step of analyses. * $p \leq .05$. ** $p \leq .01$.

of the analysis. In addition, the main effects did not predict unique proportions of the variance in life satisfaction. The final step of the analyses confirmed that the interaction between age and intrusive thoughts, $F(1, 121) = 6.11$, and the interaction between age and negative affect, $F(1, 121) = 3.92$, were significant for predicting life satisfaction.

We further examined the significant interaction effects by plotting the associations between regret-specific intrusive thoughts (see Figure 2, left panel) and negative affect (see Figure 2, right panel) and life satisfaction separately for young adults (age 20), middle-aged adults (age 50), and older adults (age 80). In support of our hypotheses, Figure 2 shows that the older the participants were, the higher the association was between regret intensity and low life satisfaction for both components of regret intensity (intrusive thoughts and negative affect). Calculations of the simple slopes supported this interpretation. We found no significant associations between regret intensity and low life satisfaction among young adults (age 20; intrusive thoughts: $\beta = .05$, $p > .10$; negative affect: $\beta = -.01$, $p > .10$). By contrast, strong associations between regret intensity and low life satisfaction were obtained among older adults (age 80; intrusive thoughts: $\beta = -.63$, $p < .01$; negative affect: $\beta = -.56$, $p < .01$). The size of the associations between regret intensity and low life satisfaction of middle-aged adults was between those of young and older adults (age 50; intrusive thoughts: $\beta = -.29$, $p < .05$; negative affect: $\beta = -.28$, $p < .05$).

Finally, we repeated the previously reported analyses by controlling the obtained interaction effects for participants' perceived opportunities to undo the consequences of their regret (and the interaction between opportunities and age, and opportunities and regret intensity). The results of the analyses showed that, if participants' opportunities were taken into account, the interaction effect between negative emotions and age was no longer significant. However, the interaction effect between intrusive thoughts and age still significantly predicted life satisfaction.

⁶ We obtained missing data with respect to participants' perceived opportunities (1), education (3), regret-specific intrusive thoughts (1) and negative affect (1), life satisfaction (4), and type of regret (8), using the same procedure described in Study 1.

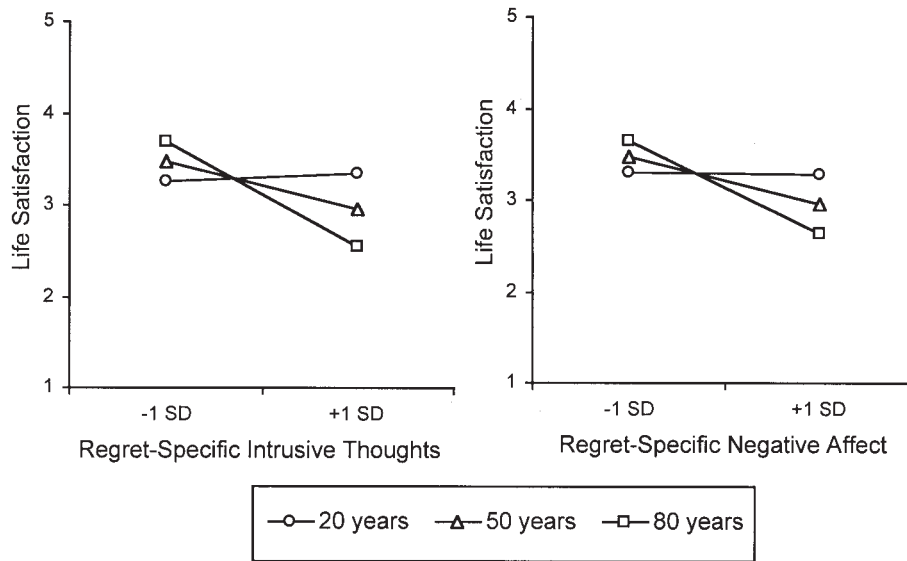


Figure 2. Moderations between age and intrusive thoughts (left panel) and negative affect (right panel) associated with regrets in predicting participants' life satisfaction.

To examine whether available future goals exert an influence on older adults' regret experiences and protect them from experiencing low life satisfaction, we conducted three hierarchical regression analyses. First, we predicted in separate analyses the two components of regret intensity (intrusive thoughts and negative affect) by (a) control variables (sex, educational level, type of regret), (b) the main effects of age and number of future goals, and (c) the interaction between age and number of future goals. We found a significant association between the main predictor variables. Age was inversely correlated with the number of reported future goals ($r = -.33, p < .01$).

The results of the analyses are reported in Table 4. Of the control variables, only type of regret significantly predicted regret-specific intrusive thoughts, $F(1, 128) = 7.50, p < .01$, and negative affect, $F(1, 128) = 8.71, p < .01$. Participants who reported commissions perceived higher levels of intrusive thoughts ($\beta =$

$.24, p < .01$) and negative affect ($\beta = .25, p < .01$) than participants who reported omissions. The main effects of number of future goals and age were not significant in the second step of the analyses. The final step of the analyses confirmed a significant interaction effect between number of future goals and age on negative affect, $F(1, 125) = 4.56, p < .05$.

To further examine the significant interaction effect, we plotted the relation between the number of available future goals and regret-related negative affect separately for young adults (age 20), middle-aged adults (age 50), and older adults (age 80). Figure 3 illustrates that the effect of available future goals on regret-specific negative affect significantly changed with age. We found the lowest levels of negative affect among older adults who perceived a high number of future goals, and we found the highest levels of negative affect among young adults who perceived a high number of future goals. Calculations of the simple slopes confirmed that

Table 4
Hierarchical Regression Analyses Predicting the Components of Regret Intensity (Intrusive Thoughts and Negative Affect) and Life Satisfaction by Age, Number of Future Goals, and the Interactions between Age and Number of Future Goals

Predictors ^a	Components of regret intensity				Life satisfaction	
	Intrusive thoughts		Negative affect		R^2	β^b
	R^2	β^b	R^2	β^b		
Age	.01	-.12	.01	-.12	.00	.06
Number of future goals	.00	.02	.00	-.02	.01	.09
Age \times number of future goals	.02	-.16	.03*	-.19	.02	.14

^a The analyses were controlled for sex, educational level, and type of regret. ^bBetas represent unique effects in each step of analyses.
* $p \leq .05$. ** $p \leq .01$.

the difference between young and older adults who reported a high number of future goals was significant ($\beta = -.33, p = .01$). In addition, the simple slope analyses showed that the direction of effects changed across age. We found a positive association between available future goals and regret-related negative affect among young adults ($\beta = .27, p = .08$) and a negative association among older adults ($\beta = -.33, p = .06$) and middle-aged adults ($\beta = -.03, p > .10$).

To test whether the interaction between age and number of future goals also predicted participants' life satisfaction scores, we repeated the previous analysis, by predicting life satisfaction as a dependent variable. The analysis did not reveal significant effects for the control variables, the main effects, and the interaction. This finding does not support our hypothesis. However, a closer inspection of the data revealed a significant and positive zero-order correlation between number of future goals and life satisfaction among older adults (60 years and older; $r = .43, p < .01$) and a nonsignificant zero-order correlation between number of future goals and life satisfaction among young and middle-aged adults (59 years and younger; $r = .03, p > .10$). Based on these results, we repeated the analysis with age group (59 years and younger, and 60 years and older) instead of age as a predictor variable, and we tested the interaction between age group and number of future goals for significance. In this analysis, the interaction between age group and number of future goals significantly predicted life satisfaction, $F(1, 122) = 5.85, p < .05, R^2 = .04$. A calculation of the simple slopes, separately for younger and older adults (adjusting for sex, education, and type of regret), supported our hypotheses by demonstrating that available future goals significantly predicted high levels of life satisfaction among the group of older adults ($\beta = .55, p < .01$), but they were statistically unrelated to life satisfaction among the younger participants ($\beta = .02, p > .10$).

Pathways to Life Satisfaction in Old Age

The aim of the final set of analyses was to test whether regret intensity can exert a mediating role in the relation between avail-

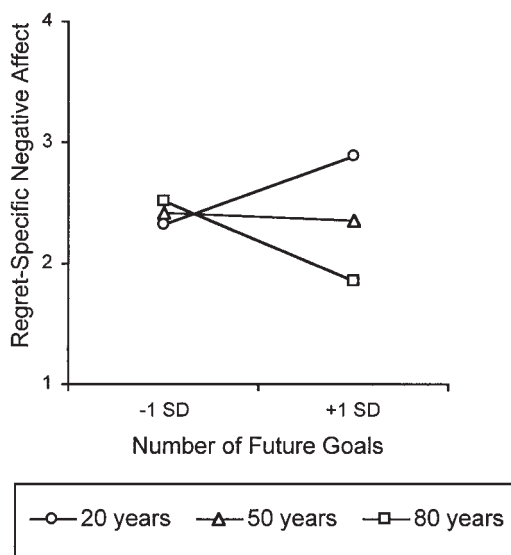


Figure 3. Moderation between age and number of future goals in predicting participants' regret-specific negative affect.

able future goals and high life satisfaction among older adults. To test this hypothesis, we performed regression analyses only among older adults (60 years and older). We first estimated the simple effects of number of future goals and the components of regret intensity (intrusive thoughts and negative affect were included as a set of predictor variables into the regression equation) on life satisfaction. We further controlled both types of predictors for each other. Finally, we conducted Sobel tests to estimate the indirect effects. All analyses were adjusted for sex, educational level, and type of regret.

The results of the analyses showed that the simple effect of the number of future goals ($R^2 = .19, p < .01$) and the components of regret intensity ($R^2 = .27, p < .01$) explained significant proportions of variance in older adults' life satisfaction scores. However, if we simultaneously entered the number of future goals and the components of regret intensity into the regression analyses, only the components of regret intensity explained a unique proportion of variance in older adults' life satisfaction scores ($R^2 = .15, p < .05$). In contrast, the number of future goals did not significantly predict life satisfaction ($R^2 = .07, p > .05$), if the components of regret intensity were taken into account. The calculation of the Sobel test did not demonstrate a significant indirect effect (using an averaged score of regret-specific negative emotions and intrusive thoughts as mediator variable; $Z = 1.70, p < .10$). However, the variance overlap between available future goals and regret intensity (regret intensity accounted for 63% of the effect of future goals on life satisfaction) together with the observed trend of the indirect effect indicate that low levels of regret intensity can partly explain the effect of number of future goals on older adults' life satisfaction.

Discussion

This research was designed to examine age effects of people's most severe regrets on broader indicators of quality of life. We proposed that the consequences of life regrets become harder to undo as people advance in age. On the basis of this assumption, we hypothesized that experiences of regret are associated with low levels of subjective well-being and high levels of physical health problems among older adults but not among younger adults. In addition, we expected that disengagement from undoing regrets and the availability of future goals would protect older adults from experiencing intense regret, thereby helping them to maintain subjective well-being and health.

The convergent evidence from two studies supports the hypothesized associations between self-regulation factors, regret experiences, and quality of life among older adults. In both studies, older adults reported fewer opportunities to undo the consequences of their most severe life regret in comparison to young adults. These findings are consistent with life span theories stating that achievement of personal goals can be difficult in late adulthood, whereas younger adults have better opportunities to realize important objectives (Carstensen et al., 1999; Heckhausen & Schulz, 1995).

The reported findings also demonstrate that the negative effects of regret intensity on indicators of quality of life increase as people advance in age. Levels of regret-specific intrusive thoughts and negative affect were more strongly associated with depressive symptoms and health problems (Study 1) and with compromised life satisfaction (Study 2) among older adults as compared with

younger adults.⁷ Moreover, the results from the mediation analyses are consistent with the hypothesis that the effects of older adults' regret intensity on physical health can be explained by levels of depressive symptoms. We note that the data also suggest that the strength of the association between middle-aged adults' regret intensity and life satisfaction are between those of young and older adults.

Overall, the obtained age effects of regret intensity on indicators of quality of life suggest that the experience of intense regret becomes particularly troublesome in old age. In this regard, it should be considered that participants' most severe regrets were associated with major developmental domains, such as family/partnership and work/education, replicating previous work on life regrets (Wrosch & Heckhausen, 2002). Given that the resolution of developmental tasks in these domains is generally thought to take place in young adulthood and early midlife (Havighurst, 1967), it is not surprising that regrets in these domains can be experienced by younger and older adults. In addition, these findings provide an explanation for the age effects of regret intensity on quality of life. For example, it can be assumed that developmental deadlines for producing adaptive change in these domains have long passed when people enter into old age (Heckhausen, 1999), and a heightened regret intensity may thus have a more profound effect on general well-being and health among older adults.

The findings also suggest that disengagement and the availability of future goals play an important role in the experience and effects of older adults' life regrets. First, the results show that perceptions of few opportunities can motivate people to disengage from undoing their regrets and that older adults reported significantly higher mean values of disengagement from undoing commission regrets as compared with younger adults. These results are consistent with a body of research demonstrating that capacities of goal accommodation and emotion regulation and the use of secondary control strategies usually increase with age (Brandstädter & Renner, 1990; Levine & Bluck, 1997; Charles, Mather, & Carstensen, 2003; Wrosch et al., 2000). In addition, these developmental processes may partly explain the finding that younger and older adults reported comparable levels of regret intensity. Although the consequences of regret-related life decisions should become more severe as people advance in age, the cognitive and emotional experiences of such regrets may be compensated by older adults' improved self-regulation skills.

In support of this argument, the study's findings suggest that individual differences in disengagement from undoing regrets and the availability of future goals can protect older adults from the experience of intense regret and the associated effects on subjective well-being and health. Study 1 shows that disengagement predicted low levels of regret intensity, depression scores, and health problems only among older adults. In addition, Study 2 demonstrates that having many future goals available predicted lower levels of regret intensity and higher levels of life satisfaction only among older adults. Moreover, the results from the presented mediation analyses confirm that the beneficial effects of adaptive self-regulation on older adults' subjective well-being and health can be mediated through a low intensity of regret. Among older adults, intensity of regret statistically explained the associations between disengagement and depressive symptoms and health problems. In addition, the association between older adults' available future goals and life satisfaction could be partly explained by

less intense regret experiences. These findings support the assumption that older adults can regulate the experience of regrets, if they disengage from undoing the consequences of their regrets and have other goals available to pursue in the future.

We predicted a different pattern of relations between self-regulation factors, regret intensity, and indicators of quality of life among young adults. Specifically, we hypothesized that being engaged in undoing regrets and a lack of available future goals would not be associated with regret intensity and indicators of quality of life among young adults. The reported findings lend support to this hypothesis only with respect to predicting indicators of quality of life. Among young adults, the availability of future goals was not associated with life satisfaction, and disengagement from commission regrets did not predict depression scores and health problems. Only disengagement from omission regrets showed an inverse association with depressive symptoms and health problems among young adults.

Contrary to our hypotheses, we found that being engaged in undoing life regrets and having many available future goals were related to high levels of regret intensity among young adults. To reconcile these contradictory findings, we note that our hypotheses were in part developed on the basis of previous research, showing that young adults who use processes that support overcoming regret (i.e., holding an internal control attribution; Wrosch & Heckhausen, 2002) do not report high levels of regret intensity. In this regard, it is possible that attempts directed at overcoming a regret and attributing a cause to an event are theoretically independent processes, and people who are engaged in undoing a regret may blame either themselves or external factors for the regretted event. In addition, it may be that young adults who pursue many future goals do not always find the time to effectively address their regrets. Such a situation may be associated with intense regret experiences among young adults, because they could have (but did not) effectively address their regrets.

The results found among young adults suggest that self-regulation factors are associated with regret-specific negative emotions and intrusions but not with broader indicators of quality of life (i.e., well-being and health). In addition, regret intensity was found to be mostly unrelated to indicators of quality of life in young adulthood, and negative affect associated with commission regrets even predicted lower levels of depressive symptoms among young adults. To provide an explanation for this pattern of results, we may have to consider that regret can serve an adaptive motivational function among younger adults (Heckhausen, 2000). To facilitate effective future actions, younger adults may need to be able to experience specific negative emotions without being confronted with spillover effects on their general well-being. In this regard, self-regulation factors such as disengagement and available future goals may in fact play a motivational role by eliciting specific negative emotions. The adaptive value of these processes is further evidenced in the fact that they do not impair an individual's general ability to have a positive outlook, which may pre-

⁷ One exception to this pattern of results was observed for intrusive thoughts about regretted omissions, which did not show age effects of regret intensity on depressive symptoms and health problems in Study 1 (see discussion on omissions and commissions reported later in this article).

serve relevant psychological resources (e.g., general well-being) needed for the implementation of adaptive future actions. Given that such motivational effects of regret experiences may emerge over time, it seems important to conduct longitudinal research on the associations between regret experiences and adaptive outcomes in young adulthood.

We also examined whether perceptions of opportunities to undo regrets explained the observed age effects of regret intensity on indicators of quality of life. The reported findings show that only some of the age effects of regret intensity were rendered nonsignificant when participants' perceived opportunities were taken into account. There are several reasons why perceived opportunities did not fully account for the associations between regret intensity and indicators of quality of life.

First, the distribution of perceived opportunities may not have been as highly associated with age as we had expected. Perhaps a greater percentage of younger adults than we had expected perceived regret-related consequences that could not be undone (e.g., having a problematic relationship with a former boyfriend because of cheating). The existence of such regrets may have reduced the age variance in perceptions of opportunities and made it more difficult to document stronger mediation effects.

In addition, we note that perceptions of opportunities can deviate from objective opportunities. If some older adults overestimated the opportunities to undo their life regrets based, for example, on a more frequent use of downward social comparisons (for comparison processes in old age, see Rickabaugh & Tomlinson-Keasey, 1997), such biases may have further reduced the association between age and opportunities. However, we also have to consider that our operationalization of the opportunities for undoing the negative consequences of regrets did not distinguish between the consequences on objective life circumstances and emotional states. It may in fact be that some older adults are able to undo the affective consequences of regretted behaviors, because of their improved capacities to regulate negative emotions (Charles et al., 2003). Given these considerations, we think it is somewhat premature to conclude that opportunities to undo regrets do not play a role in the associations between age, regret, and quality of life. Instead, we suggest that the reported research should be used in future work to devise measures of objective and subjective opportunities to address life regrets that also distinguish between the consequences on objective life circumstances and emotional states.

We note that our studies distinguished between regretted omissions and commissions. We did not develop a priori hypotheses about differences between regrets of omission and commission, but this distinction has been emphasized in previous research. For example, Gilovich and Medvec (1994) have argued that people who look back on their entire lives often regret omissions, which may imply that omission regrets are experienced more frequently and may be more troublesome among older adults. However, contrary to these ideas, our findings show that the majority of participants reported regrets of commission in Study 1, and 40% of Study 2's participants (unrelated to age) reported commission regrets if they were asked to identify their most severe life regret. In addition, the presented results do not demonstrate much evidence for age-differential effects of omission and commission regrets. Although Study 2 does not show significant interaction effects involving the distinction between both types of regrets,

Study 1 suggests that some of the reported age effects are only significant for participants' commission regrets. This pattern of results suggests only small differences between regrets of omission and commission; less pronounced age effects of omission regrets may be due to the possibility that omissions are generally more malleable than commissions (e.g., Gilovich & Medvec, 1995). In this regard, older adults' improved capacities to positively reappraise life circumstances (Wrosch et al., 2000) may have reduced the impact of omission regrets. For example, intense regret may not translate into global distress, if older adults are capable of modifying certain aspects of their regret experience, such as responsibility perceptions (for an association between attributions of omissions and global intrusions, see Wrosch & Heckhausen, 2002).

In sum, the results from two studies show that the intensity of people's most severe life regrets is associated with compromised well-being and health problems among older adults. In addition, disengagement from undoing regrets and the availability of future goals can predict lower levels of regret intensity among older adults and thereby contribute to their quality of life. Among younger adults, by contrast, self-regulation factors and the experience of intense regret are largely unrelated to broader indicators of quality of life. These findings suggest that effective self-regulation of life regrets becomes increasingly important for maintaining a good quality of life as people advance in age.

Limitations and Future Research

Although the reported studies shed further light on the experience and regulation of life regrets across adulthood, this research is not without limitations. First, our findings point to the adaptive value of disengagement and available future goals in the self-regulation of regrets among older adults. In this regard, future research should examine how both factors can interact in preserving the well-being of older adults. For example, disengagement may provide the cognitive resources necessary for the successful pursuit of other meaningful goals. In addition, available future goals may become particularly important among older adults who have successfully disengaged from objectives that can not be realized to avoid emotional states of emptiness and depression (Wrosch, Scheier, Miller, et al., 2003).

Second, it may be that recency of regret has influenced the results, given that, with greater passage of time, reinterpretations of events may change. In our analyses, we did not control the reported age effects for recency of regret, because there was a built-in developmental confound between age and the time since the regretted event occurred. In Study 1, the time since the reported regrets occurred was on average 4 to 6 years for young adults, whereas the time since the reported regrets occurred was on average between 26 and 30 years for older adults (similar results were found in Study 2; young adults = 4.7 years, middle aged adults = 15.2 years, older adults = 33.4 years). To provide some evidence for the influence of recency of regret, we conducted additional correlations separately within different age groups between recency of regret and the main dependent and predictor variables. The analyses indicated that recency of regret was not significantly associated with indicators of quality of life, regret intensity, and self-regulation variables.

Third, we found regret experiences to be associated with higher levels of health problems among older adults (e.g., constipation, skin problems, or migraine headaches). However, the reported results are limited because our measure of health problems was based on self-reports. We therefore suggest that future research should measure objective indicators of physical health and should also study other mediators (e.g., biological functioning, health behaviors) that may further explain the association between regret-related distress and a person's health.

Finally, the cross-sectional nature of the studies limits the interpretation of results. The obtained age effects may be based on cohort effects that influence the types of regrets experienced by young and older adults. In addition, we cannot advance any conclusions with respect to the causal relationship between variables, and reverse theoretical conceptualizations may also be plausible. For example, depressed people may generally engage in maladaptive self-regulation and remember negative experiences more intensely. Given that across both studies, young adults reported comparable or lower levels of quality of life than their older counterparts, and that an association between a reduced quality of life and maladaptive self-regulation was not found among younger adults, we feel that this alternative explanation is not very likely. However, future research should be undertaken to improve our understanding of the causal relations between the factors involved in the self-regulation of regret. For many reasons, it is difficult to conduct longitudinal research on life regrets. Nonetheless, the reported findings can be used to design experimental intervention studies. By engaging older adults in processes that support goal disengagement (e.g., external attributions) and increasing the salience and meaningfulness of their future goals, research should be able to shed more light on the causal processes involved in the self-regulation of life regrets.

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