# Constructing Stories of Self-Growth: How Individual Differences in Patterns of Autobiographical Reasoning Relate to Well-Being in Midlife

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**ABSTRACT** Although growth has been a central focus in narrative research, few studies have examined growth comprehensively, as a story that emerges across the interpretation of many events. In this study, we examined how individual differences in autobiographical reasoning (AR) about self-growth relate to traits and well-being in a national sample of midlife adults ($N = 88$) who ranged in age from 34 to 68. Two patterns of growth-related AR were identified: (1) positive processing, defined as the average tendency to interpret events positively (vs. negatively), and (2) differentiated processing, defined as the extent to which past events are interpreted as causing a variety of forms of self-growth. Results showed that positive processing was negatively related to neuroticism and predicted well-being even after controlling for the average valence of past events. Additionally, differentiated processing of negative events but not positive events was positively related to openness and predictive of well-being. Finally, growth-related AR patterns independently predicted well-being beyond the effects of traits and demographic factors.

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When we share our life stories, our accounts of past events are often accompanied by our interpretations of what role we believe those events have played in shaping us into our present selves. In sharing his life story, for example, one man may describe how his sister's childhood illness led to his decision to become a pediatrician, how making the basketball team in ninth grade made him realize that hard work really pays off in life, and how having his heart broken by his college sweetheart is the reason why he still has a difficult time trusting women. According to Habermas and Bluck (2000), these causal explanations about self-growth are products of *autobiographical reasoning*, an ever-evolving, interpretive process of connecting past events to self that is central to the construction of *narrative identity* in adulthood (McAdams, 1993, 2001; Pals, 2006b; Pasupathi, Mansour, & Brubaker, 2007; Singer, 2004).

In this study, we examined individual differences in the patterns of autobiographical reasoning about growth that are represented in the life stories of midlife adults, focusing specifically on the formation of *causal connections*—self-event connections that highlight how past events are perceived to have shaped or changed the self over time (Pals, 2006b; Pasupathi et al., 2007). In other words, how do adults interpret the myriad events that have been experienced by midlife and integrate them into a coherent story of self-growth? Further, what are the implications of this process for well-being? Several recent studies have established a close link in adult samples between well-being and themes of growth and positive self-transformation, as coded from narratives of one or a few preselected significant events (e.g., Bauer & McAdams, 2004; Bauer, McAdams, & Sakaeda, 2005; Pals, 2006c). However, these studies have not attempted to assess growth comprehensively, as a narrative of self-development that intersects with a variety of life experiences and emerges naturalistically across the telling of the entire life story. In this investigation, we focused on two patterns of growth-related narration: (1) *positive processing*, which refers to the extent to which the interpretations of past events tend, on average, to be more positive or negative in terms of their impact on self-growth, and (2) *differentiated processing*, or the variety of distinct themes of positive growth that are represented across the life story. We generally hypothesized that these narrative patterns represent individual differences in the underlying processes that guide autobiographical reasoning about self-growth and are indicative of the overall health and maturity of narrative identity.

Although we expected these processes to be characteristic qualities of narration that relate to personality traits in meaningful ways, we also expected each to contribute above and beyond traits to the prediction of well-being in midlife.

Additionally, our focus on naturally occurring connections between past events and self-growth allowed us to differentiate between the valence of the events as they were described as happening in the past and the valence of their perceived impact on self, as separable sources of variability within the life story. By making this distinction, we were able to evaluate two previously unexamined questions about the relationship between growth and well-being. First, is the extent to which a person interprets the impact of past events in positive, growth-promoting ways independent of the extent to which he or she includes more positive or negative events in the life story? In other words, can positive growth be distinguished from a more general tendency to narrate the life story positively? Second, although it has been assumed that negative events challenge the self and therefore offer unique opportunities to enrich well-being through self-exploration and self-transformation (e.g., King, Scollon, Ramsey, & Williams, 2000; Pals, 2006c), no studies have tested this assumption directly by evaluating growth from positive and negative events separately and comparing their relations with well-being. We address these issues in the current study, with the overarching aim of developing a more nuanced perspective on the relationship between growth and well-being in midlife.

## Using Causal Connections to Assess Growth in the Life Stories of Midlife Adults

According to McAdams (1993, 2001; McAdams & Pals, 2006), a mature sense of identity in adulthood is formed through the construction of a coherent life story that integrates past, present, and future and provides life with a sense of meaning and purpose. The capacity to construct a coherent life story first emerges in late adolescence when individuals become able to engage in autobiographical reasoning, defined by Habermas and Bluck (2000) as "a process of self-reflective thinking or talking about the personal past that involves *forming links between elements of one's life and the self*" (p. 749, emphasis added). Autobiographical reasoning (AR) can result in two major types of self-event connections: those that emphasize

self-stability and those that emphasize self-change (Pasupathi et al., 2007). Self-stability connections serve to maintain a sense of continuity in the self, such as through explaining an event as the result of some characteristic of the self. In contrast, self-change connections serve to highlight the narrator's perceptions of how past events have shaped the self in dynamic ways, either by causing a clear change in self (e.g., my divorce caused me to become a more adventurous person; my divorce gave me a new perspective on life) or through revealing characteristics that had not been fully understood previously (e.g., my divorce made me realize my own strength; Pasupathi et al., 2007).

Both stability and change connections are fundamental to the continuity and coherence of self in adulthood (Pasupathi et al., 2007). However, we argue that self-change connections, or what we have here termed *causal connections*—that is, those connections that emphasize how past events have played a causal role in shaping the growth of the self (positively or negatively)—are especially important in midlife because they capture the person's own understanding of how he or she has developed over time, in response to life's many highs, lows, challenges, and transitions. Consistent with this perspective, the capacity to form causal connections and make growth-promoting interpretations of events becomes more pronounced and sophisticated as people progress through adulthood, perhaps peaking in early old age before it begins to decline (Bauer et al., 2005; Pasupathi & Mansour, 2006; Singer, Rexhaj, & Baddeley, 2007).

Methodologically, the concept of autobiographical reasoning has resulted in new developments in life story research, with an emphasis on identifying specific products of autobiographical reasoning (e.g., indicators of global coherence, self-event connections, causal connections) wherever they occur in the free flow of life story narration (e.g., Bauer & Bonanno, 2001; Habermas & de Silveira, 2008; Habermas & Paha, 2001). In this study, we expanded this approach into the assessment of individual differences in how adults construct stories of self-growth, an approach we first advocated through the qualitative analysis of three case studies (Pals, 2006b). In this approach, a person's story of self-growth is operationally defined as the full set of causal connections that are formed during the oral telling of the life story. Each causal connection then gets coded for important differentiating qualities, including the valence of the past event, the valence of the impact of the event on self-growth, and specific

themes of growth (see Pals, 2006b). From this microlevel coding process we were able to develop indicators of growth-related patterns of AR.

## Positive and Differentiated Processing: Growth-Related AR and Its Relations With Traits and Well-Being

How do adults come to see themselves as having grown from past events? We define self-growth very broadly, as any interpretation of a past experience that in some way moves a person toward (as opposed to away from) experiences and mindsets that enhance positive self-development and quality of life, by increasing clarity of identity, sense of purpose, self-efficacy, self-insight, meaningful connections with others, well-being, etc. In this way, our definition of growth is meant to encompass a number of more specific and conceptually overlapping coding categories in the literature that highlight growth-promoting outcomes (explicitly or implicitly), including positive self-transformation (Pals, 2006b), intrinsic and integrative growth (Bauer et al., 2005), meaning making (McLean & Thorne, 2003), integrative meaning (Blagov & Singer, 2004), and redemption sequences (McAdams, Reynolds, Lewis, Patten, & Bowman, 2001). Looking specifically at the narration of negative events, we have argued that growth is the result of a two-step process of (1) acknowledging the impact of a negative event and openly exploring its meaning and potential to change the self and (2) coming to a sense of positive resolution (Pals & McAdams, 2004; see also Pals, 2006a, 2006b, 2006c). For example, positive self-transformation (i.e., growth), as coded from middle-aged women's narratives of difficult life events, was found to predict optimal well-being and be a function of two independent process dimensions coded from the narratives—exploratory processing and positive resolution. In other words, the women who causally connected the difficult event to a positive sense of growth exhibited AR that was both exploratory and positive, whereas those who did not connect their difficult events to positive growth were less exploratory or more negative in their interpretations (Pals, 2006b). In a recent expansion of these ideas, Lodi-Smith, Geise, Roberts, and Robins (2009) examined two similar process dimensions—affective and exploratory processing—in narratives of personality change during college and showed that they independently predicted emotional health above and beyond personality

traits. The students whose narratives of personality development exhibited the most exploration and positive affective processing were the healthiest after 4 years of college, suggesting a story of positive growth.

Building on the two-dimensional model of growth described above and the recent literature on narrative identity, we conceptualized two process dimensions to account for individual differences in how adults engage in AR about growth: (1) the overall positivity (vs. negativity) of how past events are interpreted as affecting self-growth, which we term *positive processing*, and (2) the variety and richness of positive growth interpretations, or *differentiated processing*, which should result from a more exploratory approach to autobiographical reasoning that is always open to adding new forms of growth to the story. These *growth-related patterns of AR* and their hypothesized relations with traits and optimal well-being are described below. We define optimal well-being as combining the life satisfaction and positive affect of subjective well-being (Deiner, Suh, Lucas, & Smith, 1999) with the deeper sense of meaning and purpose in life provided by psychological well-being (Ryff, 1989; Ryff & Keyes, 1995).

### *Positive Processing*

First, our model and the literature suggest that the most basic aspect of individual differences in growth-related AR is simply how positively versus negatively adults interpret the enduring impact of past events on the self over time. For example, themes of growth (Bauer & McAdams, 2004; Bauer et al., 2005) redemption (McAdams & Pals, 2006; McAdams et al., 2001), and positive self-transformation (Pals, 2006c) emphasize positive, growth-promoting interpretations of past events and relate positively to well-being, whereas themes of lack of resolution or closure (e.g., lasting wounds, conflicted feelings; Pals, 2006c; King et al., 2000) and contamination (McAdams et al., 2001) acknowledge adverse effects on one's growth and relate negatively to well-being. By midlife, most people are likely to have at least a few causal connections that highlight how past events have negatively affected self-growth, in terms of acknowledging setbacks in the realization of self-defining goals, enduring emotional struggles, and so on. However, we suggest that the larger question for well-being is whether those more negative interpretations of events

dominate the story line or are outweighed by positive interpretations. Thus, we defined positive processing as a person's *average tendency*, across all of the causal connections included in the life story, toward making positive (vs. negative) interpretations of how past events shape the self and contribute to an overall story of growth.

We made several predictions regarding positive processing. First, in order to establish the validity of our measure of positive processing as a personality-related quality of life story narration, we hypothesized that positive processing should correlate negatively with Neuroticism and be independent of the rest of the traits of the Five-Factor Model. Neuroticism involves a negative, pessimistic mindset (e.g., Suls & Martin, 2005) that should result in a tendency toward making more negative than positive interpretations of how past events affect self-growth. Consistent with this idea, several recent studies have demonstrated a link between Neuroticism and negative patterns of self-narration, including negative emotional tone (McAdams et al., 2004); the absence of positive growth themes (Bauer et al., 2005); a depressogenic explanatory style for negative events (Adler, Kissel, & McAdams, 2006); and negative-themed self-descriptions (Raggatt, 2006).

Second, we hypothesized that positive processing would predict well-being, and that this would be true even after taking the average valence of the past events included in causal connections into account. Although it has been assumed that the valence of the interpretations of past events (i.e., their meaning) is more important to well-being than the valence of the events that are being interpreted, this assumption has yet to be tested directly. Previous studies have typically held the valence of the past events constant, by eliciting narratives of predefined events (e.g., high points, low points, difficult events; e.g., McAdams et al., 2001; Pals, 2006c), or, if they have allowed for a broader sampling of different types of past events, they have not evaluated the valence of past events as a dimension of individual differences (e.g., Blagov & Singer, 2004). Thus, we evaluated the valence of the past events separately from the interpretation of the impact on the self and, from this, were able to create an index of one's average tendency toward seeing self-growth as resulting more from positive events, negative events, or a mix of both. Although this dimension could be seen as a more "objective" assessment in that it focuses more on what actually happened, separate from interpretation, it is also the case that the choice of which events

to include in one's life story is itself a creative and subjective aspect of self-narration (McAdams, 2001) and could be an important source of individual differences in its own right that relates to well-being. While we did not make a specific prediction regarding whether or not average valence of past events would relate to well-being, we did hypothesize that positive processing would be a more substantial predictor and that the association between positive processing and well-being would be independent of past events.

### *Differentiated Processing*

As illustrated by the man in the opening example, causal connections may be evaluated on a more specific level than simply whether the impact on self-growth is positive or negative. Specific themes of growth emerge when people interpret past events in a reflective fashion, such as the clarification of career identity in the causal connection about deciding to become a pediatrician, life wisdom in the connection to making the basketball team, and struggles with mature intimacy in response to the breakup experience. Thus, a second important aspect of growth-related AR that should relate to well-being is *differentiated processing*, or the extent to which a person integrates a variety of distinct forms of self-growth into the life story. A more differentiated story of self-growth is suggestive of the more general concept of self-complexity, which has been associated with benefits for well-being (Linnville, 1987). In the case of the life story, however, the differentiated self is tied to changes perceived as being brought about by specific events in one's past and suggests an enduring tendency to be open and exploratory in one's approach to growth-related AR.

We operationally defined differentiated processing as the number of different growth themes represented across a person's causal connections from among three that were selected to be prominent themes in the narrative identity literature and reflective of significant gains in psychosocial and cognitive-affective development. These three growth themes were defined as *identity clarity*, or the development and clarification of identity-defining goals, beliefs, and values (Erikson, 1963; McAdams, Hoffman, Day, & Mansfield, 1996); *intimacy*, or the formation of meaningful, healthy relationships (Erikson, 1963; McAdams et al., 1996); and *wisdom/insight*, which refers to conceptual shifts in thinking that serve to deepen or broaden one's perspective on self, life, or relationships (see Bauer

& McAdams, 2004; Blagov & Singer, 2004; Bluck & Glück, 2004; McLean & Thorne, 2003). In terms of other approaches to narrative coding, identity clarity and intimacy are similar to the agency/communion distinction used by Bauer and McAdams (2004) in their coding of growth in adults' stories of life transitions. Wisdom/insight is based on a number of highly similar coding categories used by narrative researchers, including integrative growth (Bauer et al., 2005), integrative meaning (Blagov & Singer, 2004), meaning making (McLean & Thorne, 2003), and wisdom (Bluck & Glück, 2004).

We made several predictions regarding differentiated processing. First, with respect to its validity as a personality-related tendency of autobiographical reasoning, we hypothesized that differentiated processing would be associated with the trait of Openness to Experience and not with the other traits of the Five-Factor Model. Generally speaking, the representation of a variety of forms of growth is suggestive of self-complexity, and openness has been associated with greater complexity within the life story (McAdams et al., 2004). In addition, openness has been associated with exploratory processing within narratives (Pals, 2006b), which we expect is required for differentiated self-growth to be present within the life story. Second, we hypothesized that differentiated processing would explain more of the variance in optimal well-being than just positive processing alone, given that it represents specific gains in healthy adult development (identity, intimacy, wisdom) and requires a particularly reflective and mature approach to autobiographical reasoning that goes beyond simply making more positive than negative interpretations of past events.

Additionally, we hypothesized that differentiated processing in the context of negative events would be more predictive of well-being than differentiated processing in the context of positive events. Negative events, unlike positive events, tend to challenge the existing story line of narrative identity. However, one's attempt to work through these challenges can promote self-exploration, which creates opportunities for richly transformative forms of self-growth to occur (Helson, 1992; King, 2001; Pals, 2006c; Tedeschi, Park, & Calhoun, 1998). Thus, we reasoned that if an adult sees oneself as having clarified identity, developed greater intimacy, and become a wiser person, this differentiated sense of self-growth would be a greater and more enriching psychological achievement, and one that involved more effortful reflection and exploration, if it was interpreted

as the result of negative events than if it were interpreted as the result of positive events. Consistent with this idea, an experimental study showed that the reflective processes of writing and talking were more beneficial for well-being when used in response to negative events than in response to positive events (Lyubomirsky, Sousa, & Dickerhoof, 2006). In contrast, positive events were found to benefit well-being when they were processed more superficially, such as when participants were asked to simply relive a positive event in their minds. Writing and talking may indicate the presence of the kind of exploratory AR that is required to transform negative events into a variety of new forms of self-growth.

### *Incremental Predictive Validity of Growth-Related AR Patterns*

Our final set of hypotheses involved examining the incremental validity of growth-related AR patterns for the prediction of optimal well-being, beyond the effects of personality traits and the demographic factors of gender, age, and socioeconomic status (SES), each of which have been implicated in the prediction of well-being (e.g., Deiner et al., 1999). With respect to traits, associations with narratives (e.g., McAdams et al., 2004; Raggatt, 2006) have been well established, and several studies have already shown that narratives predict emotional health and well-being beyond personality traits (Bauer et al., 2005; Lodi-Smith et al., 2009). Thus, we expected to replicate this pattern in the current study. With respect to demographic variables, gender and age have been linked to self-narratives in a variety of ways (e.g., McLean & Breen, 2009; Singer et al., 2007), and although SES has been less of a central focus in narrative research, there is a growing literature to suggest that SES can shape how adults process stressful events (Gallo & Matthews, 2003) and make meaning from their lives (Snibbe & Markus, 2005). Given these associations, we examined how growth-related AR related to demographic factors as well as its independence from them in the prediction of well-being.

## Overview of the Present Study

The hypotheses laid out above were tested in a socioeconomically diverse national sample of midlife men and women ranging in age from 34 to 68 who had participated in the original MIDUS study conducted in 1995–1996 (Brim, Ryff, & Kessler, 2004). The growth-related AR patterns were assessed using causal connections

identified within oral Life Story Interviews (McAdams, 1993) and related to survey measures of demographic factors, personality traits, and well-being. To review, we hypothesized that (a) positive processing would be associated with Neuroticism and predict optimal well-being independent of the average valence of past events; (b) differentiated processing would be associated with Openness to Experience and optimal well-being, and these associations would be primarily driven by differentiated processing of negative events; and (c) growth-related patterns of AR would predict well-being independent of one another and beyond traits and demographic factors. Finally, we examined these hypotheses primarily with a measure of what we call optimal well-being, which combines measures of subjective and psychological well-being. However, because subjective and psychological well-being represent distinct traditions in the study of well-being (Keyes, Shmotkin, & Ryff, 2002), we also include analyses for each type of well-being treated separately.

## METHOD

### Participants

Participants were 88 midlife adults who had participated in the Midlife in the United States Survey (MIDUS) study conducted by the John D. and Catherine T. MacArthur Foundation Network on Successful Midlife Development. The MIDUS survey, conducted in 1995, was a national study investigating the overall health and well-being of midlife American adults (Brim, 2000; Brim et al., 2004). The main sample of the MIDUS study consisted of over 3,000 noninstitutionalized, English-speaking adults who were recruited by telephone via random digit dialing and completed both a telephone survey and a self-administered questionnaire that was sent to them in the mail (referred to as the Midlife Development Inventory, or MIDI). The MIDI covered a wide range of demographic and psychosocial information, including information about work, marriage and family, physical health, and the psychological factors of personality, well-being, mental health, and beliefs and attitudes (see Brim et al., 2004, for more detail on the sample and the survey).

#### *Recruitment of Subsample*

The 88 adults included in this study were recruited by Anne Colby as a subsample of the MIDUS to participate in an in-depth semistructured

interview about the life story and social responsibility in midlife (Colby, 2002; see also Colby, Sippola, & Phelps, 2001). In order to represent the geographical diversity of the national sample, Colby targeted participants who lived within 50 miles of one of five major cities (Boston, Chicago, Atlanta, Phoenix, and the San Francisco Bay Area). The coordinator of the main MIDUS survey provided Colby with five lists, one for each of the regions. Each list consisted of a randomly selected subset of the participants of the larger survey sample who lived in that region. Colby called participants in the order they were listed until she had recruited 20 from each region (Colby, personal communication, February 8, 2010). Of those recruited, 94 participants completed the interview. Colby et al. (2001) reported on how the 94 compared to the full sample on a large set of psychological and demographic variables. The subsample did not differ from the full sample on most variables, including gender, ethnicity, household income, neuroticism, physical and mental health, and work involvement. However, the subsample was found to be somewhat more educated and higher on Openness and Conscientiousness than the full sample, which is consistent with agreeing to a lengthy face-to-face interview. It should also be noted that although the current sample did exhibit a higher education level than the main sample, it was still the case that the current sample represented a wide range of educational backgrounds (see the demographics section). Eighty-eight of Colby's original 94 were included in the present study because 6 of the interviews were either incomplete or judged to be too incoherent or underdeveloped to code for the present purposes.

*Sample Demographics*

Participants (40 women; 44 men) ranged in age from 34 to 68 ($M = 48$; $SD = 9.6$). The sample was predominantly White, with 83% describing themselves as White/European American, 8% Black/African American, 2% Asian or Pacific Islander, 5% "Other" (i.e., not the previously mentioned categories or Native American), and 2% missing on the question of race. In terms of education level, 22% had completed high school or less, 26% had completed some college or an associate's degree, 33% had a 4-year college degree, and 19% had completed some graduate school or had a graduate degree (in the MIDUS full sample, 21% held a 4-year college degree). The mean household income was \$60,313 (range: \$0 to \$300,000+), and the median household income was \$49,000. Education level and household income were modestly correlated, $r = .29$, $p < .01$. In order to create a composite measure of socioeconomic status (SES), we $z$-scored the education level and household income variables and averaged them together.

### Life Story Interview

The interview protocol used by Colby (2002) in her original study consisted of two parts. The second part, not used in this study, included a series of questions on the expression of social responsibility across many life domains (Colby et al., 2001). The first part, which was the portion used in this study, included an abbreviated version of McAdams's (1993) Life Story Interview. This interview consists of a series of open-ended questions designed to encourage adults to reflect on the significant events, patterns, and themes in their lives and guide them through the narration of their life stories. The specific questions used in this abbreviated version asked participants to (1) organize one's life into chapters and describe the significant events and characteristics of each chapter, (2) highlight the high point and low point of one's life, and (3) identify and describe the two or three people who have had the most significant influence on one's life story. The participants' oral responses to these questions, which had been audiotaped and transcribed, offered a rich source of narrative material for the assessment of AR via causal connections.

### Identifying Causal Connections Within Life Story Interviews

In order to code the life story interviews for patterns of AR, we first had to translate the text of the participants' interviews, which ranged in length from 1,169 words to 12,631 words and averaged 6,916 words ($SD = 2{,}832$), into codable units of AR. We accomplished this by identifying each causal connection the narrator made over the course of the interview. A causal connection was operationally defined as any passage in which the narrator interprets a past experience, broadly defined, as having had an enduring causal impact on the self or the trajectory of life. The past experience could be broad (e.g., being raised on a farm) or specific (e.g., the day I met my wife), but the critical feature is that the narrator used explicit causal language to connect the past experience to an impact on self, positive or negative, that endured well beyond the experience itself (e.g., lasting emotional effects, shifts in ways of thinking, changes in self-understanding, a life-changing decision).

In order to arrive at a representative set of causal connections for each participant, two judges (the first author and a trained graduate student research assistant) first independently read through the life story portion of each interview and identified every time the narrator appeared to make a causal connection. For each causal connection found, each judge noted the beginning and the end of the relevant passage and provided a brief description of the two main components of the connection, the past experience and the impact on the self that was attributed to the past experience. Second, the judges compared their identifications and, through a process of discussion and consensus, decided on a final set of causal

connections for each participant. This process yielded a total of 765 causal connections across the 88 participants, with an average of 8.69 ($SD = 4.78$) causal connections per person.

By having two people independently read the interviews and then settle their disagreements, we felt confident that we had successfully identified the important causal connections for each person. However, in order to ensure that this identification process was reasonably reliable, a third judge was trained to identify causal connections using a set of life story interviews taken from a separate sample of midlife adults. After a period of training and discussion, the newly trained judge and the first author independently identified causal connections across four randomly selected interviews in the separate practice sample. Across the four interviews in this practice set, the first author and the trained judge agreed upon 35 causal connections, with the first author identifying a total of 40 and the trained identifier finding a total of 47. Because causal connections were identified from free-flowing text, kappa could not be used to evaluate the level of agreement achieved across these two sets of identifications. Instead we adapted Winter's (1973) formula for category agreement, which was originally used for calculating agreement between one's own coding and an expert coder on the identification of power motive imagery in sets of stories written in response to images from the Thematic Apperception Test (TAT). Applying the category agreement formula in this context, an agreement ratio was calculated by (1) multiplying by 2 the number of causal connections that were agreed upon by the two identifiers ($35 \times 2$) and (2) dividing that number by the sum of the total number identified by each of the identifiers ($40+47$). This calculation yielded an agreement coefficient of .80.

Having achieved an adequate level of agreement in the practice set, the trained judge identified the causal connections within 10 randomly selected interviews from the 88 in the present study. This process yielded a total of 110 causal connections, 76 of which overlapped with the 98 causal connections that had originally been identified for these 10 interviews. Using the formula presented above, the ratio of agreement for the 10 interviews was .73 ($[76 \times 2]/[110+98]$). Overall, this process of establishing reliability, which produced agreement ratios of .80 and .73 across two sets of life story interviews, provided adequate evidence that despite the challenging and inherently messy nature of the task of isolating causal connections from transcribed oral narration, a core level of agreement could be reached in this process.

## Causal Connection Coding

In order to calculate the indicators of AR (positive processing, differentiated processing, and average event valence) for each person, each individual causal connection was first coded for several different characteristics,

including (1) past event valence, (2) valence of impact on self-growth, and (3) the presence of three specific growth themes: identity clarity, intimacy, and wisdom/insight. For each of these coding dimensions, described below, one judge coded all 765 causal connections, and a second judge coded a subset of 121 causal connections across 10 randomly selected interviews in order to establish reliability. Both judges were blind to the hypotheses of this study and to participants' scores on the non-narrative survey measures.

*Average Event Valence*

The valence of the past event described within each causal connection was coded on a 1 to 5 scale (1 = *very negative*, 3 = *neutral/mixed*, and 5 = *very positive*). Coders were instructed to base ratings of event valence on three factors: (1) a culturally shared understanding of what constitutes a positive (e.g., marriage) and negative (e.g., divorce) life event, (2) the supporting details of the story as told by the narrator (e.g., a divorce with a bitter custody battle involved adds to the negative valence), and (3) the description of the emotional intensity of the event at the time (e.g., "It was the lowest moment of my life"). Coders were also instructed to be careful to separate the valence of the event as it happened in the past and the valence of the impact of the event on the self, which was coded separately (see below). Interjudge agreement, which was calculated with an intraclass correlation between the two judges' sets of ratings, was .80. An overall index of average event valence was calculating by averaging event valence ratings across the causal connections identified for each person.

*Positive Processing*

The first of the two main indicators of growth-related AR, positive processing, was based on ratings made for each causal connection of the valence of the impact of the past event on self-growth. The valence of the impact was rated on a 5-point scale for each causal connection, with a rating of 1 indicating a very negative and growth-limiting impact, a rating of 3 indicating a neutral/mixed impact, and a rating of 5 indicating a very positive and growth-promoting impact. The concept of growth was defined very broadly in this context, referring to any interpretation of a past experience that serves to move a person toward (as opposed to away from) experiences that enhance self-development and quality of one's life, by increasing clarity of identity, sense of purpose, self-efficacy, self-insight, meaningful connections with others, well-being, and so on. Interjudge agreement for impact on growth, which was calculated with intraclass correlation, was .81. The index of positive processing was calculated by averaging the ratings for valence of impact on growth across the causal connections for each person.

*Differentiated Processing*

The measurement of differentiated processing was based on the assessment of the presence of three specific themes of positive growth that could have been attributed to past events within the life story: identity clarity, intimacy, and wisdom/insight. In order to calculate these indicators, each causal connection was coded in terms of the absence versus presence (0, 1) of each of these three growth themes. The coding of these themes was not mutually exclusive; that is, a single causal connection could potentially contain all three themes if the impact of the event involved all three forms of growth.

Identity clarity was defined as when a person describes a past event's impact as bringing about increased clarity regarding self-definition and purpose or meaning in life. Identity clarity could take many shapes and generally refers to the content of what makes you who you are—for example, choice of career, ideological beliefs and values—and the feeling of knowing yourself and the direction or meaning of your life. The kappa for agreement between the two judges on the presence vs. absence of identity clarity was .63 (84.3% agreement). Identity clarity was coded as present in 233 (30.5%) of the 765 causal connections, and it was present at least once within 76 (86.4%) of the 88 life stories.

Intimacy was defined as when a person describes a past event's impact as shaping one's personal relational life in a positive way, as through meeting one's life partner, making lifelong friends, developing a greater closeness or intimacy with a person, repairing an important relationship, or developing a new understanding about how to relate to close others in one's life. The kappa for agreement on the presence versus absence of this theme was .63 (89.3% agreement). Intimacy was coded as present in 77 (10.1%) of the 765 causal connections, and this theme was present at least once within 45 (51.1%) of the 88 life stories.

Wisdom/insight was defined as when a person describes a past event's impact as causing an internal, cognitive shift or transformation in how the person thinks in a generalized sense. This shift in thinking is characterized by the person's own development, through a process of reflection stimulated by past events, of important new insights about self, relationships, people, life, or the world. The enhanced perspective that is contained within these insights communicates the idea of wisdom from lived experience—valuable knowledge that makes someone a deeper or more complex person and enhances his or her ability to live well and maturely. The kappa for agreement on the presence versus absence of this theme was .71 (90% agreement). Wisdom/insight was coded as present in 155 (20.3%) of the 765 causal connections, and this theme was present at least once within 56 (63.6%) of the 88 life stories.

Differentiated processing was calculated three ways—for the life story as a whole and separately for positive and negative events. The overall indicator of differentiated processing was calculated by simply summing the number of distinct themes present across all of a person's causal connections, with a possible range from 0 (*no themes present in the life story*) to 3 (*all three themes present in the life story*). Differentiated processing of negative events was calculated by summing the number of themes that were present (0 to 3) within only those causal connections that were based on events rated either 1 (*very negative*) or 2 (*somewhat negative*) on event valence. Similarly, differentiated processing of positive events was calculated by summing the number of themes that were present (0 to 3) within only those causal connections that were based on events rated either 4 (*somewhat positive*) or 5 (*very positive*) on event valence.

### *Coding Examples*

The majority of the causal connections in the current sample could be described as following one of three patterns: (1) a positive event with a positive impact on growth, (2) a negative event with a positive impact on growth, and (3) a negative event with a negative impact on growth. An example of each of these types of causal connections, along with how it was coded, is presented in Table 1. In the first example, a man in his 50s reflected on his elementary school years, describing how the seemingly ordinary achievement of figuring out long division shaped the course of his life. This causal connection received a 4 (*positive*) on past event valence (event = figuring out long division) because, although it was quite positive, it was not significant enough on its own to be rated a 5. The impact on self (pursuit of math-related interests) received a 5 on positive processing (*very growth-promoting*) and a 1 (*present*) for the theme of identity clarity because the man drew a long-standing sense of career direction from his elementary school achievement.

In the second example shown in Table 1, a man described the impact of his parents' divorce when he was a young adult. The very painful experience of finding out his parents were getting divorced, long after he thought something like that could ever happen, received a rating of 1 (*very negative*) on past event valence. The self-impact attributed to this event received a 5 on positive processing (*very growth-promoting*) and the specific growth themes coded as present were wisdom/insight and intimacy. Wisdom was coded as present because of the conceptual insight this man experienced as he worked through his parents' divorce, and intimacy was also coded as present because he specifically applies his insight about relationships to how he approaches his own marriage.

**Table 1**
Examples of Causal Connection Coding

| Coding | Text of Causal Connection |
|---|---|
| *Example 1*<br>Event valence = 4 (*somewhat positive*)<br>Impact on self-growth = 5 (*very positive*)<br>Themes = identity clarity | "We had been doing multiplication tables for what seemed like years, and I finally mastered them, and then I was having trouble with long division. And finally, like, one day, like somebody turned on a light, long division made sense. . . . From that point on I remember that little switch in there that turned over, and it turned out that things I pursued, both academically and professionally after that point in time, somehow or another had a basis in some kind of mathematics." |
| *Example 2*<br>Event valence = 1 (*very negative*)<br>Impact on self-growth = 5 (*very positive*)<br>Themes = intimacy, wisdom | "There was an evening I got a phone call from my dad. . . . And that was the night he told my mother he wanted a divorce. . . . For a while, I thought I would never get married. My parents had been married for 24 years and eleven months when that happened. So I thought, 'Gee if they can't make it, why would anybody?' . . . But I'd say in the long run, it just made me realize that you just have to, you know, always continue trying to date each other, instead of ever starting to take each other for granted." |
| *Example 3*<br>Event valence = 1 (*very negative*)<br>Impact on self-growth = 1 (*very negative*) | "When I was—my first love—when I realized what was going on with that . . . I think that changed my attitude. . . . I built up fences after that. . . . I'm never going to let anybody be able to hurt me like that again." |

The third example in Table 1 illustrates how past events can also be interpreted in ways that highlight negative effects on self-growth. In this example, a woman talks about how a breakup during young adulthood, nearly 20 years earlier, still affects her in adverse ways. Although the participant is a bit vague about what exactly happened, it is clear from the context of the interview that she is describing a very painful breakup from her first love. This event received a rating of 1 on past event valence. More importantly, however, is the way the woman interprets the meaning and

impact of the experience. Nearly 20 years later, the pain still seems raw in the way she describes the event, and she has developed a strategy of avoiding intimacy. Through this interpretation, which received a rating of 1 (*very negative*) on positive processing, the woman magnifies the negative meaning of the event and arguably limits her own growth as a person.

## Survey Measures

### *Optimal Well-Being*

Well-being was assessed with two overlapping but distinct aspects of well-being, subjective and psychological well-being.

A measure of subjective well-being (SWB) was created by standardizing and averaging together three commonly used self-report indicators of subjective well-being (Deiner et al., 1999), life satisfaction, positive affect, and negative affect. The life satisfaction measure was a single-item measure that asked the participants, "How would you rate your life overall these days?" Participants responded on an 11-point scale ranging from 0 (*the worst possible life overall*) and 10 (*the best possible life overall*). This measure has been successfully used in previous studies on life satisfaction (see Keyes et al., 2002). The measures of positive and negative affect (see Mroczek & Kolarz, 1998) required participants to report how much of the time over the past 30 days they felt each of six negative emotional descriptions ("so sad nothing could cheer you up," "nervous," "restless or fidgety," "hopeless," "that everything was an effort," and "worthless") and six positive emotional descriptions ("cheerful," "in good spirits," "extremely happy," "calm and peaceful," "satisfied," and "full of life"). Each emotional statement was rated on a 5-point scale. The six negative affect items were averaged together to create a negative affect score, and the six positive affect items were averaged together to create a positive affect score. Finally, all three indicators of subjective well-being were standardized and then averaged together (with negative affect reverse-scored to indicate lower subjective well-being) to create one subjective well-being composite. Cronbach's alpha for this three-scale composite was .76.

Psychological well-being (PWB) was assessed using Ryff's (1989; Ryff & Keyes, 1995) well-established measure of psychological well-being. Ryff's measure was designed to go beyond a basic measure of feeling happy and measures six facets that are expected to characterize a psychologically well-adjusted and developmentally mature adult, including self-acceptance, purpose in life, environmental mastery, positive relations with others, personal growth, and autonomy. These six facets were measured in the MIDUS with abbreviated, three-item versions of the original scales (see Keyes et al., 2002). The items were rated on a scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*). All scales were reversed so

that higher scores meant higher levels of well-being, and scale scores were created by summing the three ratings for each (i.e., scores could range from 3 to 21). A composite measure of psychological well-being was created by averaging these scales together. Cronbach's alpha for this six-scale composite was .70.

The composite measure of optimal well-being was created by averaging the subjective and psychological well-being scales together. These scales were correlated .68 ($p < .001$).

### *Personality Traits*

The Big Five personality trait dimensions were measured with scales derived from ratings of 25 self-descriptive adjectives. Each adjective was rated on a 4-point scale assessing the level of self-descriptiveness (ranging from *not at all* to *a lot*). The five scales were calculated by averaging the ratings of the adjectives in each scale. Cronbach's alphas were .79 for Extraversion (outgoing, friendly, lively, active, talkative), .79 for Agreeableness (helpful, warm, caring, softhearted, sympathetic), .42 for Conscientiousness (organized, responsible, hardworking, careless—reverse-scored), .75 for Neuroticism (moody, worrying, nervous, calm—reverse-scored), and .84 for Openness (creative, imaginative, intelligent, curious, broadminded, sophisticated, adventurous). For more detail on these scales and their use in the MIDUS study, see Prenda and Lachman (2001).

## RESULTS

The descriptive statistics for all the variables of the study are reported in Table 2, and the bivariate correlations among these variables as well as the demographic variables of gender, age, and SES are reported in Table 3. Table 4 reports partial correlations for indicators of AR with the main variables of the study, controlling for narrative length and other relevant narrative and personality factors for each variable. The correlations reported in Tables 3 and 4 are described in detail below.

### Preliminary Analyses: Intercorrelations, Traits, and Demographics

#### *Intercorrelations Among Narrative Variables*

The top left quadrant of Table 3 reports the intercorrelations among all of the narrative variables derived from the life story. One preliminary concern was the extent to which indicators of AR would be

**Table 2**
Descriptive Statistics for Main Study Variables

| $N = 88$ | $M$ | ($SD$) | Min. | Max. | Possible Range |
|---|---|---|---|---|---|
| *Narrative variables* | | | | | |
| Narrative length (word count) | 6916 | (2832) | 1169 | 12631 | — |
| Total number of causal connections | 8.69 | (4.78) | 1.00 | 25.0 | — |
| Average event valence | 2.72 | (.71) | 1.00 | 4.50 | 1–5 |
| Positive processing | 3.56 | (.54) | 2.00 | 4.86 | 1–5 |
| Differentiated processing | 2.00 | (.86) | 0.00 | 3.00 | 0–3 |
| Diff. proc. of negative events | 1.20 | (.87) | 0.00 | 3.00 | 0–3 |
| Diff. proc. of positive events | 1.36 | (.95) | 0.00 | 3.00 | 0–3 |
| *Survey scale measures* | | | | | |
| Optimal well-being | .00 | (.92) | − 3.58 | 1.21 | — |
| Subjective well-being | − .00 | (.82) | − 3.70 | 1.14 | — |
| Life satisfaction | 7.66 | (1.50) | 2.00 | 10.00 | 0–10 |
| Positive affect | 3.39 | (.67) | 1.33 | 4.50 | 1–5 |
| Negative affect | 1.45 | (.52) | 1.00 | 3.83 | 1–5 |
| Psychological well-being | 16.84 | (2.12) | 10.67 | 19.83 | 3–21 |
| Extraversion | 3.21 | (.59) | 1.20 | 4.00 | 1–4 |
| Agreeableness | 3.54 | (.46) | 2.40 | 4.00 | 1–4 |
| Conscientiousness | 3.47 | (.39) | 2.25 | 4.00 | 1–4 |
| Neuroticism | 2.15 | (.67) | 1.00 | 3.75 | 1–4 |
| Openness to experience | 3.16 | (.57) | 1.43 | 4.00 | 1–4 |

influenced by the general verbosity or length of the interviews, which we assessed with word count. As shown in the top row of Table 3, narrative length was positively correlated with total number of causal connections, showing, not surprisingly, that the amount of AR evident in the life story is at least partially dependent on how much the person has to say. In addition, differentiated processing, which is based on the sum of three different kinds of causal connections, was positively associated with both narrative length and total number of causal connections, but more strongly with total number of causal connections. In order to take these potential confounds for differentiated processing into account, narrative length and total number of causal connections were used as control variables in several analyses.

**Table 3**
Intercorrelations Among Main Study Variables

| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Narrative length | .58** | −.21 | .20 | .33** | .34** | .20 | −.18 | −.11 | −.15 | .16 | .11 | −.07 | .01 | .06 | −.09 | .08 | −.04 |
| 2. Total number of CCs | | −.05 | .00 | .57** | .47** | .54** | −.11 | −.10 | −.05 | .10 | .00 | −.05 | .02 | .03 | .00 | .12 | .05 |
| 3. Average event valence | | | .68** | .06 | −.31** | .39** | −.10 | .20 | .23* | .00 | −.18 | .02 | −.15 | .12 | .22* | .09 | .18 |
| 4. Positive processing | | | | .22* | −.03 | .37** | −.10 | .07 | .25* | .03 | −.18 | .02 | −.30** | .10 | .37** | .29* | .37** |
| 5. Differentiated processing | | | | | .61** | .65** | −.17 | −.12 | .25* | .04 | −.07 | −.14 | −.16 | .15 | .21* | .27* | .25* |
| 6. Diff. proc. of neg. events | | | | | | .25* | −.07 | −.26* | .20 | .13 | .09 | −.09 | −.15 | .21* | .24* | .39** | .33** |
| 7. Diff. proc. of pos. events | | | | | | | −.16 | −.03 | .17 | −.02 | −.16 | −.08 | −.16 | .08 | .12 | .16 | .16 |
| 8. Gender | | | | | | | | −.04 | −.14 | −.07 | .31** | −.13 | .22* | −.21* | −.21* | −.08 | −.16 |
| 9. Age | | | | | | | | | .03 | −.15 | −.10 | −.06 | −.04 | −.09 | −.02 | −.13 | −.08 |
| 10. SES | | | | | | | | | | .16 | −.01 | −.09 | −.15 | .29** | .30** | .27* | .32** |
| 11. Extraversion | | | | | | | | | | | .39** | .36** | −.15 | .53** | .26* | .30** | .30** |
| 12. Agreeableness | | | | | | | | | | | | .23* | −.02 | .17 | .03 | .18 | .12 |
| 13. Conscientiousness | | | | | | | | | | | | | −.22* | .14 | .28** | .38** | .37** |
| 14. Neuroticism | | | | | | | | | | | | | | −.21* | −.51** | −.45** | −.54** |
| 15. Openness | | | | | | | | | | | | | | | .23* | .29** | .27* |
| 16. Subjective well-being | | | | | | | | | | | | | | | | .68** | .92** |
| 17. Psychological well-being | | | | | | | | | | | | | | | | | .90** |
| 18. Optimal well-being | | | | | | | | | | | | | | | | | |

*Note*. CC = causal connections; SES = socioeconomic status. $N = 88$.
**$p \leq .01$. *$p \leq .05$.

**Table 4**
Correlations of Indicators of Autobiographical Reasoning With Measures of Traits and Well-Being, Controlling for Narrative Length and Additional Relevant Factors

| | Optimal Well-Being | PWB | SWB | Neuroticism | Openness |
|---|---|---|---|---|---|
| Total number of causal connections (cctot) | .09 | .10 | .07 | .02 | .00 |
| Average event valence | .18 | .10 | .21$^{+}$ | – .15 | .14 |
| *Indicators of growth-related AR* | | | | | |
| Positive processing | .37** | .31** | .36** | – .30** | .12 |
| (controlling for ave. event valence) | (.34**) | (.33*) | (.31**) | (– .28*) | (.03) |
| (controlling for neuroticism) | (.24*) | (.21*) | (.20$^{+}$) | — | (– .02) |
| (controlling for SES) | (.22*) | (.22*) | (.19$^{+}$) | (– .27*) | (.05) |
| Diff. processing of negative events | .36** | .39** | .28** | – .17 | .21* |
| (controlling for cctot) | (.36**) | (.38**) | (.28**) | (– .19) | (.22*) |
| (controlling for ave. event valence) | (.44**) | (.44**) | (.37**) | (– .25*) | (.28*) |
| (controlling for openness) | (.40**) | (.39**) | (.33**) | (– .20) | — |
| (controlling for SES) | (.36**) | (.35**) | (.29**) | (– .19$^{+}$) | (.21*) |
| Diff. processing of positive events | .17 | .15 | .14 | – .17 | .07 |
| (controlling for cctot) | (.15) | (.12) | (.12) | (– .21$^{+}$) | (.08) |
| (controlling for ave. event valence) | (.07) | (.08) | (.03) | (– .16) | (.02) |

$N = 88$. **$p \leq .01$. *$p \leq .05$. $^{+}p < .10$.

Average event valence was associated with positive and differentiated processing in predictable ways. First, average event valence was strongly and positively correlated with positive processing ($r = .68$), demonstrating that the average tendency to include positive versus negative events within the life story covaried closely with the average tendency to interpret those events positively versus negatively. In other words, the person who included many negative events also tended to interpret those events negatively and vice versa.

Additionally, differentiated processing of negative events was negatively associated with average event valence, and differentiated processing of positive events was positively associated with average event valence. In other words, the more negative the past events in one's story, the higher one's score on differentiated processing of negative events, presumably because the inclusion of negative events in the life story is the necessary first step for constructing a variety of forms of self-growth from them (and vice versa for positive events). Due to these intercorrelations, we used average event valence as a control variable in several analyses.

*Indicators of AR and Traits: Convergent and Discriminant Validity*

Next, we examined how the growth-related AR patterns related to the traits of the Big Five, in order to establish convergent and discriminant validity of these patterns as personality-related processes of AR. First, as predicted, Table 3 shows that positive processing was negatively associated with Neuroticism ($r = -.30$, $p < .01$) and unrelated to the rest of the Big Five traits. In comparison, average event valence was not significantly correlated with Neuroticism ($r = -.15$), and Table 4 further shows that the correlation between positive processing and Neuroticism remained significant after average event valence was taken into account ($r = -.28$, $p < .05$). This pattern of results suggests that although there is a strong general tendency to be more positive or negative in telling one's life story, Neuroticism is specifically associated with the tendency to interpret events negatively in terms of their effects on self-growth. Second, although we predicted that differentiated processing would be positively associated with Openness, this was true only for differentiated processing of negative events ($r = .21$, $p < .05$), and this correlation remained significant after simultaneously controlling for narrative length, total number of causal connections, and average event valence ($r = .28$, $p < .05$). Overall, this pattern of correlations was consistent with expectations and provides construct validation for the growth-related AR patterns as personality-related processes of narrative identity.

*Indicators of AR and Demographic Variables*

Although we did not make specific predictions, the indicators of AR showed some correlations with demographic factors that are worth

noting, especially with SES. As shown in Table 3, SES was unrelated to narrative length and total number of causal connections, but it was positively correlated with all of the main indicators of AR, including past event valence, positive processing, and all three measures of differentiated processing; it was also significantly correlated with optimal well-being. Across the board, people with more education and higher household incomes told more positive stories of self-growth, in terms of the events included in the stories and the interpretations of those events. However, the correlation between SES and positive processing ($r = .25$, $p < .05$) was reduced to nonsignificance ($r = .13$, *ns*) when average event valence was taken into account, suggesting that adults lower in SES tell more negative growth stories at least in part because their stories include more negative events, which would be consistent with the notion of a greater level of hardship in their lives that is difficult to transform into positive growth.

Differentiated processing of negative events was also negatively correlated with age. Although we did not predict this finding, it is generally consistent with research showing that as people approach older age, they focus on self-stability rather than self-change (McLean, 2008) and decline in affective complexity (Labouvie-Vief, Diehl, Jain, & Zhang, 2007). It could be that the oldest participants in this sample, who were in their late 50 s and early 60 s, are starting to tell a life story that moves away from the exploration and complexity of negative events and focuses more on positive, stabilizing aspects of life.

## Patterns of Growth-Related AR and Well-Being

### *Positive Processing*

Our first main hypothesis was that positive processing would be positively associated with optimal well-being and that this association would be independent of the average valence of the past events included in adults' stories of self-growth. As shown in Table 3, positive processing was positively correlated with all three measures of well-being, and Table 4 shows that these correlations remained significant after controlling for average event valence. It was the case that average event valence was positively correlated with subjective well-being (Table 3), but this correlation became marginal when controlling for narrative length and did not account for the correlation between positive processing and subjective well-being (Table 4). Thus, despite the

strong overlap between the average valence of events and the average valence of interpretations, it was the interpretations of events in relation to self-growth that mattered most for adults' well-being.

*Differentiated Processing*

Our second main hypothesis was that differentiated processing would predict optimal well-being and that differentiated processing of negative events would be a better predictor of well-being than differentiated processing of positive events. Consistent with our hypothesis, Table 3 shows that although total differentiated processing correlated with all measures of well-being, this association was entirely due to differentiated processing of negative events. Differentiated processing of positive events showed no significant correlations with well-being. In addition, as shown in Table 4, this pattern of correlations held across all three measures of well-being even after controlling for total number of causal connections and average event valence. Adults who interpreted negative events as contributing to a variety of forms of self-growth scored higher on all measures of well-being than adults who did not interpret negative events in such a rich and reflective manner.

What is the mechanism that explains the relationship between differentiated processing of negative events and optimal well-being? We hypothesize that a sustained openness to and exploration of the different ways that negative events may transform the self ultimately enrich well-being by providing a variety of psychologically meaningful forms of self-growth. However, there are at least two different possible explanations that we sought to rule out with further analyses. First, our measure of differentiated processing of negative events is confounded with the general amount of positive growth attached to negative events. In other words, is the association with well-being explained by the number of negative event–positive growth connections, regardless of whether those connections include identity clarity, intimacy, and wisdom? In order to examine this alternative explanation, we calculated how many negative event–positive growth causal connections participants included in their life stories. This variable was unrelated to optimal well-being ($r = .10$), and the correlation between differentiated processing of negative events and optimal well-being remained after partialing it out ($r = .33$, $p < .01$).

A second alternative explanation is that the effect of differentiated processing of negative events could be explained by just one of the three themes included in the measure rather than the cumulative effect of having all three themes. Three additional variables were calculated, one for the presence versus absence of each theme in connection with a negative event. First, each of the three themes showed a weak but at least marginal correlation with optimal well-being on its own (identity clarity: $r = .24$, $p < .05$; intimacy: $r = .19$, $p < .10$; wisdom: $r = .18$, $p < .10$). Second, we calculated three regression analyses for optimal well-being, one for each theme, in which we entered the theme in the first step and then entered differentiated processing of negative events in the second step. In each case, the effect of differentiated processing of negative events remained significant (standardized betas ranged from .30 to .37), showing that its effect was larger than that of any one growth theme included in the measure. Thus, the effect does seem to be additive, with each additional theme providing a more psychologically enriching profile of growth.

*Incremental Predictive Value of Growth-Related AR*

Our third hypothesis was that the growth-related AR patterns would each explain significant portions of the variance in optimal well-being even after taking personality traits and demographic factors into account. First, Table 4 shows that although the correlation between positive processing and optimal well-being dropped from .37 ($p < .01$) to .24 ($p < .05$) when controlling for Neuroticism, it did remain significant, even though the correlation between Neuroticism and optimal well-being was substantial ($r = -.54$). This correlation continued to remain significant when SES was also controlled for, which had significant correlations with both positive processing and optimal well-being. Only in the case of subjective well-being did controlling for Neuroticism reduce the association to marginal significance. In addition, the correlation between differentiated processing of negative events and optimal well-being remained significant after controlling for openness as well as SES, and this was true across all measures of well-being.

Finally, we conducted a hierarchical regression to test the unique contributions of growth-related AR patterns above and beyond all of the demographic factors and the five personality traits. We entered the demographic factors of gender, age, and SES in the first

step ($R^2\Delta = .12$, $p < .05$), the traits of the Five-Factor Model in the second step ($R^2\Delta = .32$, $p < .001$), and the growth-related AR patterns in the third step ($R^2\Delta = .10$, $p < .01$). Although the demographic factors and personality traits together accounted for 44% of the variance in optimal well-being, growth-related AR explained an additional 10% of the variance, and each pattern made a significant unique contribution (positive processing: $\beta = .23$, $p < .01$; differentiated growth from negative events: $\beta = .27$, $p < .01$).

## DISCUSSION

This study showed that midlife adults whose stories of self-growth were both predominantly positive (i.e., positive processing) and included a variety of forms of growth from negative events (differentiated processing of negative events) were higher on optimal well-being in midlife than those whose growth stories did not contain these qualities, even after taking the average valence of past events included in the story, personality traits, and demographic factors into account. Below we consider some of the implications of these findings as well as the limitations of this study and possible future directions for narrative identity research.

### Valence and Stories of Self-Growth: The Relative Importance of Positive Processing Over Average Event Valence

Although many studies have examined aspects of growth-oriented narration across many specific episodes within the story (e.g., total number of redemption sequences across several important memories), this is the first study of which we are aware that treated the average valence of past events and the average valence of their interpretations as separable aspects of autobiographical reasoning. By making this distinction, we were able to evaluate whether positive processing could be separated from a more general tendency to narrate the life story positively that encompasses both event selection and event interpretation. Our findings supported our hypothesis: positive processing was a significant predictor of optimal well-being even after controlling for the average valence of past events. In other words, adults who told predominantly positive stories about how past events affected self-growth, regardless of how negative those

past events may have been, scored higher on well-being than adults whose interpretations were less positive overall.

The distinction described above was further supported by the finding that positive processing was negatively correlated with Neuroticism but average event valence was not. In other words, the negative mindset associated with Neuroticism manifested itself specifically through negative interpretations of growth rather than a more general negativity that included a greater emphasis on negative events. For example, several participants mentioned that they had dropped out of college (typically viewed as a negative event), but one man who scored above the mean on Neuroticism and low on positive processing spoke about how dropping out of college led him to get into insurance, a line of work that only "losers" pursue. Decades after the negative past event, this man was still interpreting the impact in a particularly growth-limiting and negative manner. It is important to remember, however, that Neuroticism only partially accounted for the association between positive processing and optimal well-being; the correlation remained significant even after Neuroticism was partialed out. One possibility to examine in future research is the idea that low levels of positive processing operate as one mediator of the relationship between Neuroticism and well-being, if neurotic adults are more likely to hold on to overly negative interpretations of how past events affect self-growth.

### The Unique Role of Differentiated Processing of Negative Events for Growth and Well-Being

The findings for the interrelations among positive processing, Neuroticism, and well-being suggest that negative events can overwhelm the life story if they are interpreted in such a way that the person constructs a predominantly negative story of self-growth (i.e., low scores on positive processing). However, the findings for differentiated processing, which were independent of positive processing and specific to negative events, suggest that there is "more to the story" for negative events and that it is not enough to simply avoid negative events entirely in constructing a story of positive self-growth. Rather, adults whose stories evidenced a variety of psychologically meaningful growth themes in connection with negative events scored higher on well-being than those who did not, and the same was not true for differentiated processing of positive events.

Why was the combination of identity, intimacy, and wisdom from negative events so much more connected to well-being than the same combination of themes for positive events? We expect that growth from negative events requires a more reflective and exploratory form of autobiographical reasoning than growth from positive events, producing a sense of growth that is especially strengthening and enriching. For example, one man in the study spoke of how the birth of his first child (positive event) clarified and strengthened his conservative beliefs and values (identity clarity), whereas another man in the study spoke of how he and his wife were unable to have biological children (negative event) and so ended up adopting twins with cerebral palsy, which gave him a new sense of purpose and led him to open a day care center (identity clarity). Both causal connections contribute to differentiated processing in that they bring about identity clarity, but it is not difficult to see how the latter, with the emotional challenges and self-exploration it must have involved, may be a more significant factor in relation to well-being.

What accounts for differences in the extent to which differentiated processing of negative events is present in the life story? The current study suggests that one important factor is a person's level of Openness to Experience, which was positively correlated with differentiated processing of negative events. While we originally expected that Openness would involve a general commitment to ongoing growth throughout adulthood and would therefore correlate with differentiated processing of both positive and negative events, this was not the case. In contrast, our findings are consistent with growing evidence to suggest that the role of Openness in growth may be specific to how adults process the emotional impact of negative events. For example, whereas Pals (2006b) found a positive correlation between coping openness (vs. defensiveness) and exploratory processing in narratives of difficult life events, others have failed to find predicted correlations between Openness and indicators of growth when growth is assessed across both positive and negative past events (McLean & Fournier, 2008).

Why would Openness only be important for growth in the context of negative events? One possibility is that Openness is especially important for negative events in contrast to positive because it keeps people from defending too strongly against negative emotions, which could result in attempting to avoid thinking about negative events and even write them out of the life story entirely. Instead, we argue

that an open acknowledgment of the negative emotional impact of an event can act as a ''narrative springboard'' for open, exploratory processing and growth-related AR (Pals, 2006a, 2006b, 2006c). For example, one woman in the current study spoke honestly about how the ''anger in me was terrific'' after the death of her husband, but that through the experience, ''I've learned that listening is one of the most important gifts you can ever give to another'' (wisdom/insight). In contrast, a man told a growth story that included many positive interpretations of positive events (see example 1 in Table 1), but on the topic of his most negative experiences (e.g., his father's alcoholism), he was unable to articulate his thoughts and feelings about it, even 50 years later, suggesting defensive avoidance. His growth story was predominantly positive but not very differentiated; he had not openly explored the meaning of his most negative emotional experiences, thus limiting opportunities for self-growth and potentially also limiting well-being (see Pals, 2006b, for a full analysis of this case). Thus, while it is certainly possible that the repression and avoidance of highly painful emotions may have some benefit (Bonanno, Kelter, Holen, & Horowitz, 1995; Coifman, Bonanno, Ray, & Gross, 2007), particularly shortly after a traumatic event, the current findings provide an important reminder that it may not be healthy to attempt to minimize negative emotions and avoid thinking about them entirely, particularly as time passes. Rather, by taking a life story perspective, it becomes clear that negative events are an enduring part of the self, and that, at least in many cases, being able to see the self as having grown from them allows a person to integrate painful memories into narrative identity in a nonthreatening, healthy way.

## Limitations and Future Directions

A strength of this study was the methodological approach to assessing growth, which involved identifying and coding several qualities of causal connections that emerge naturalistically during the oral narration of the life story. Each participant was identified by a unique set of causal connections that captured his or her own story of self-growth. However, the complexity of this method also carried with it some issues and limitations. First, the number of causal connections identified varied widely across participants. Although this may have caused the reliability of the assessment of AR to vary

across participants, the number of causal connections itself did not correlate with measures of personality or well-being, nor did controlling for it alter any of the results. It was also the case that the causal connections that were included for each individual, no matter how few or how many, told a distinctive and authentic story. For example, one woman who had just three causal connections told a very simple and powerful story of how the birth of her son and raising him had given her life meaning and how her divorce and the ensuing struggles had taken away that meaning and left her bitter. Her scores on positive processing and differentiated processing were quite low, and it does not seem that asking her to attempt to share more causal connections would provide a more valid measure of her growth-related AR.

A second limitation is that our coding of past event valence was not fine-grained enough to capture the full range of variability in the objective severity of negative events. On the one hand, the narrative approach highlights the idea that the life story is subjective and that everyone can identify his or her own emotional low points in life, no matter how objectively easy or hard their lives may have been. From this perspective, objective severity matters less than how negative events are interpreted in relation to growth, and people are missing an opportunity to grow and potentially achieve optimal levels of well-being if they fail to engage in differentiated processing. On the other hand, it certainly could be the case that event severity was a factor that could have placed an objective limit on growth-related AR. For example, almost everyone received a rating of 1 (*very negative*) for event valence on their life low point; however, the low points reported ranged from being broken up with in college to being sexually abused as a child. It is not hard to imagine that the former might be easier to associate with positive growth than the latter. Further, it is certainly possible that some events are so traumatic that people chose to eliminate them from their life stories either because they do not want to share them (Pasupathi, McLean, & Weeks, 2009) or because they are protecting themselves from even thinking about them (e.g., repressive coping); in these cases, it may be that the healthiest option is to not engage in growth-related AR.

One possible clue to the significance of objective event severity for growth-related AR is in our findings for SES. Participants who were lower in SES tended to include more negative events relative to positive events in their stories, and they also showed lower levels of

positive and differentiated processing. Although our current analyses are not able to immediately shed light on exactly what explains these differences, one possibility is that the least educated and economically most disadvantaged in this study were dealing with objectively more difficult life circumstances than those higher in SES, both in terms of the severity and the number of negative events, which makes it more difficult to transform those events into growth. Future research should consider how such realities as low SES and the severity of negative events may place objective limits on growth-related AR.

A third limitation of this research is that we were unable to determine causality due to the correlational and nonlongitudinal nature of the design. Although our theoretical perspective asserts that autobiographical reasoning affects well-being, it is entirely possible that the opposite is true, that well-being affects how people interpret past events. Indeed, experimental studies relating the manipulation of mood to autobiographical memory (e.g., Blaney, 1986) suggest that current well-being shapes how we remember the past. In truth, it is quite likely that there is a reciprocal relationship between autobiographical reasoning and well-being. What is needed are studies using a variety of different designs, including longitudinal, experimental, and intervention designs, in order to begin to accumulate evidence that supports a causal effect of autobiographical reasoning on well-being. For example, an intervention encouraging differentiated processing of negative events could be developed to assess whether this form of autobiographical reasoning predicts an increase in well-being over time, controlling for baseline levels of well-being.

The current findings point to several other directions for future research on narrative identity. First, what is the nature of the relationship between positive events and well-being? Perhaps the unique significance of positive events would be clarified if we investigated other types of autobiographical reasoning as well, such as self-stability connections (Pasupathi et al., 2007). Indeed, whereas negative events challenge narrative identity and offer turning point opportunities for self-change, positive events may operate more subtly, functioning to affirm the continuity of identity and mark the stable, predictable progress of adult life. In addition, it may be possible that positive and negative events serve different functions at different stages of adulthood, with positive events being especially important for identity in young adulthood, when identity is first developing,

and negative events becoming more important to identity as adults progress through life and are more likely to have encountered difficult circumstances that challenge identity (McLean & Lilgendahl, 2008).

Finally, future research should also look beyond traits to how a variety of different factors shaping the life context of the person (e.g., developmental, cultural, social) affect patterns of growth-related AR (McLean, Pasupathi, & Pals, 2007). One area of critical importance is the link between socialization experiences in childhood and adult life story narration. Conversational styles used by parents affect how children learn to narrate experiences and develop an autobiographical sense of self (e.g., Haden, Haine, & Fivush, 1997; Sales, Fivush, & Peterson, 2003). This area of research also suggests that there may also be important gender, culture, and class differences in how parents shape autobiographical reasoning (Wang, Leichtman, & Davies, 2000; Wiley, Rose, Burger, & Miller, 1998). For example, with respect to class, working-class parents have been characterized as raising their children with an emphasis on having to be tough to deal with life's inevitable difficulties, whereas middle-class parents raise their children with an emphasis on self-actualization, growth, and the capacity to reach goals and overcome obstacles (Snibbe & Markus, 2005). These cultural differences in the meaning systems perpetuated by class could be one factor that contributed to the SES differences in growth-related AR in the current study.

## CONCLUSION

By midlife, most adults have experienced myriad life experiences, many positive and many negative; our study suggests that what may matter most for how they are feeling in the present is not so much what happened in the past but rather the extent to which they weave those events into a story of self-growth that is both predominantly positive and openly explores the transformative possibilities of negative events. Moreover, the associations between growth-related AR and well-being were quite robust, showing independence from traits and demographic factors. In closing, growth-related patterns of autobiographical reasoning may reflect important individual differences in personality functioning that shape narrative identity and well-being over time, perhaps especially in relation to how adults

make sense of their most difficult and identity-challenging experiences in life.

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