Posthumous events affect rated quality and happiness of lives

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Abstract

Diener and colleagues (2001) illustrated that individuals rely heavily on endings to evaluate the quality of a life. Two studies investigated the potential for posthumous events to affect rated life quality, calling into question the intuitive "ending" of a life at death. Undergraduates read a series of short life narratives to assess the consequences of posthumous reversals of fortune on judgments of the goodness and happiness of the life. In a 2x2 within-subjects design, lives positive and negative in valence were displayed twice: once from birth to death and once each life was followed by a posthumous event of opposite valence. Results demonstrated that posthumous reversals of fortune shift judgments of the goodness and happiness of the life in the direction of the valence of the posthumous event. These effects were not related to an individual's religiosity or the degree to which the life made an engaging story. We suggest that the posthumous happy effect may be a case of a more general process, which we call retroactive re-evaluation.

Keywords: endings, quality of life, happiness, positive psychology, subjective well-being, death, posthumous events, happiness.

1 Introduction

Evaluative judgments of events are heavily influenced by the terminal event, a feature that Kahneman and his colleagues encompass within what they call the peak-end effect (Kahneman, Wakker & Sarin, 1997; Kahneman et al., 1993). When the sequence of events in question happens to be a life history, the sad reality is that death appears to be the end of the sequence. Hence, lives by their nature have a negative ending. As well, because of the aging process, the positive peak in a life is usually well before the end, and the later years are often associated with a decline in competences, power, and influence. These existential realities should bias life-evaluative judgments in a negative direction. In this study, we explore this situation, and examine the degree to which this negative bias is minimized by incorporating lives into a larger framework that includes posthumous events.

In the last decade, there has been a growing interest in understanding well-being, as evidenced by recent books (Diener & Suh, 2000; Kahneman, Diener & Schwarz, 1999), and the development of appropriate measurement tools (e.g., Diener et al., 1985). The positive psychology movement (Seligman & Csikszentmihalyi, 2000), directed at optimizing the quality of life, has stimulated much of this work.

Quality of life (lifetime subjective well being) is a retrospective measure; as such, it suffers from distortions produced by memories of actual experiences, and in particular, a disproportionately high influence of the end state (Frederickson, 2000; Kahneman, Wakker, & Sarin, 1997; Frederickson & Kahneman, 1993). Judgments of the quality of complete lives must be determined by the self, near or at the end of life, or by third parties based on experiences of the life of another or narrative life descriptions. In a study asking participants to rate the goodness of lives based on brief life narratives, Diener, Wirtz and Oishi (2001) showed that judgments of the quality of a life were heavily influenced by endings. The ending of a life is typically considered to be at death, however some aspects of a life, particularly those having to do with the life's meaning, can be affected by events that occur after a life is over. In this regard, we note that most of the work on the end-effect has manipulated hedonic rather than meaningful events. We believe that posthumous events act much like traditional end-events, shifting life judgments in the direction of the valence of the posthumous event. One can understand that the quality of a life judgments might include posthumous events, but it seems unlikely that judged happiness of a life would be affected by posthumous events. Nonetheless, in this study, we included life happiness ratings as well as quality of life ratings. Studies of end effects, particularly work by Kahneman and his colleagues, typically involve a "hedonic" as opposed to "meaning" manipulation. It is reasonable to believe that changes in meaning are more likely to reflect significantly upon prior events.

The religiosity of the participants was measured to examine whether shifts in judgments of life quality (and

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perhaps happiness) due to posthumous events are influenced by the strength of religious beliefs. Many religions define a good life by the total number of a person's good works, which is not necessarily bounded by death. Similarly, meaning in life, which is stressed by religions, over hedonism, can sometimes only be realized after the life is over. Furthermore, to the extent that a person believes in an after-life, associated with many religions, the person might be able to "appreciate" the posthumous events.

The present study involved judgments by American college students of the goodness of lives and the amount of happiness (and unhappiness) in these lives. We used a within-subject design, in which the participants rated eighteen different life paragraphs. Four lives, embedded within the other life stories, were designed to evaluate the effect of posthumous reversals of fortune. The life histories were presented in narratives, each a short paragraph, some of which included posthumous events that reversed the valence of the life ending.

2 Study 1

2.1 Method

Participants were 68 students (29 male, 39 female) at the University of Pennsylvania who received one half hour of research participation credit in introductory psychology by participating in this study. The questionnaire was completed at the student's own or another computer terminal, and was presented and tabulated using Survey-Monkey. The questionnaire included 18 short life histories, for each of which the participant was asked to respond to five questions, as follows: "For you personally, how good is this life?", "How good is this life in general?", "How good a life would this be for your child to live?", "How much total happiness is in this life?", and "How much total unhappiness is in this life?" The scale ranged from zero to one hundred for all questions. For the quality of life questions zero was "as bad as possible" and one hundred was "as good as possible." For the happiness questions zero was "no happiness" and one hundred was "as much happiness as possible." For the unhappiness questions zero was "no unhappiness" and one hundred was "as much unhappiness as possible."

We discovered that responses to the first (personal) and second (general) question were virtually the same. For each of the four stories of relevance to the present paper, we computed a Pearson correlation of these two ratings, across the 68 participants. The average correlation was 0.78 (range 0.62 to 0.88); similarly, the average correlation between the personal good life rating and the rating for the life of one's child was 0.70 (range 0.63 to 0.75). These high correlations justified our use of only the first (personal) question for the rating of quality of a

life. The total life happiness rating correlated a mean of 0.59 (range 0.49 to 0.68) with personal good life. Unlike the first three questions, it is not directly about quality of life. The last question, about total unhappiness in the life, correlated a mean of -0.66 (range -0.61 to -0.75) with the happiness question. Because these questions are in principle independent (e.g., one life could have a lot of happiness and unhappiness, and another little of either), we retained both in the analysis. Therefore, for the present study, we used only the responses to the first (personal good life), fourth (total happiness) and fifth (total unhappiness) questions.

The 18 life scenarios were chronological presentations of a life, with a focus on career and major life events. The first and last of the 18 scenarios were identical, and described a baseline or what we call "vanilla" life with no significant main event. This "vanilla" life history was described as follows: "Jerry works hard, has a wife and two kids. He lives in a small town where he raises his kids who grow up and go to college. When he is not at work he spends much of his time on his hobby, fly-fishing. He retires from his job at age 65 and lives until the age of 75." The beginning of this life was repeated with a different character name, for each of the 18 scenarios, with departures from the baseline story beginning at or after the fourth decade (30–39 years old) of life. The initial segment of each life was the same: "X (first name) works hard and has a wife and two kids," and all characters died at age of 75, with no further detail on the circumstances of their death.

Of the 16 experimental stories, four were specifically included to test the effect of posthumous events, and it is these four that are described in the present study. Four others were designed to examine the comparison between meaningful versus hedonic focal events, and four involved measurement of duration neglect or location of a critical event in a life (early or late). The 16 life events were conceptually organized into eight pairs, which were parallel except that the critical life event was either positive or negative. The life histories varied in length from 29 words (2 sentences) to 85 words (4 sentences). They were arranged in a random order or a reversal of that same random order, except that the sequence of 18 began and ended with the baseline "vanilla" life history.

For the present analysis, we consider only the four stories that were included to test the effects of posthumous reversals, and the initial baseline ("vanilla") story for comparison purposes. The four critical stories were comprised of two pairs of stories. In each pair, one story described the life up to the point of death (we designate this the "up-to-death" story), and the second was the same exact story followed by a posthumous reversal. The posthumous story continued after death, and presented information that reversed the valence of the critical mean-

Table 1: Mean ratings of goodness and happiness of lives contrasting lives with their posthumous reversals. (N=68).

Story	Rating	Up-to-death story mean	Posthumous story mean	Up-to-death minus posthumous	t(68) paired	Effect size (Cohen's d)
Drug discovery	Goodness	86.0	57.9	28.1	9.475***	1.15
	Happiness	84.8	71.7	13.1	5.629***	.68
	Unhappiness	18.4	31.6	−13.2	4.958***	.60
Political prisoner	Goodness	24.6	46.1	−21.5	6.950***	.79
	Happiness	30.0	38.8	−8.8	3.395***	.41
	Unhappiness	71.1	64.8	6.3	2.285*	.28

*** p<.001, * p<.05.

ingful event in the story. The two pairs of stories are presented below, with the posthumous addendum for that version underlined.

Positive drug story pairs (positive refers to the valence within the lifetime): "Alex devotes his life to finding cures for deadly diseases. He works hard has a wife and two kids. At age 35, he discovers a drug that cures a painful disease and is praised by the world until his death at age 75. *After his death* it is found that the drug causes serious birth defects in the babies conceived by people on this drug. His drug is said to have caused more harm than good and Alex's work is discredited."

Negative prison story pairs: "Jose devotes his life to being a political activist. He works hard has a wife and two kids. At age 35, he is thrown in jail as a traitor to his government where he remains in terrible conditions until his death at age 75. *After his death* he is finally recognized as one of the most forward-looking political thinkers and becomes a hero and martyr of his country."

Religiosity was measured on a four-point scale, from "not at all" to "extremely" religious.

2.2 Results

In the SurveyMonkey format, participants cannot see or access the rating they made to any prior question. As a result, if people intended to rate the two lives the same, they would have to try to remember what they had previously rated. In the context of 5 ratings each of 18 stories, this would not be possible.

We have a measure of reliability because we presented the initial ("vanilla") story a second time, in the 18th position, for all participants. The mean ratings on goodness of life differed by only 2.9 points, with a mean differences for happiness of 2.5 and unhappiness of 1.9 (none significantly different at p<.05). Reliability correlations (based on first versus final baseline story, across 68 participants)

were 0.70 for goodness, 0.59 for happiness, and 0.44 for unhappiness.

The critical comparisons are between two pairs of stories: the positive drug cure stories with an up-to-death or reversed posthumous ending, and the negative prison story with an up-to-death or reversed posthumous end. We examined three measures for each story: the responses to "How good is this life" and "How much total happiness is in this life?" and "How much total unhappiness is in this life?" The results of each comparison are displayed in Table 1. In all six cases (comparisons of differences between two pairs of stories, on three measures), the valence of the posthumous event significantly influenced the life goodness or happiness ratings (p<0.001 in all comparisons but unhappiness in the political prisoner scenario). That is, posthumous events affected judgments of the goodness of lives, and even the judgment of the happiness of lives. The effect was always in the direction of moving the total life evaluation in the valence direction of the posthumous event. The mean change for posthumous effect size for happiness/unhappiness is about one half of the change for goodness of life.

To provide some perspective on the evaluations of the up-to-death and posthumous stories, the initial "vanilla" story was rated (mean) 68.1 for personal good life, 79.1 for happiness and 22.9 for unhappiness. Because this life is considered quite positive, there is a ceiling ceiling effect. Therefore, the vanilla story is significantly different from the negative event stories, but not from the positive event stories.

The correlation between religiosity and the difference between prison life and posthumous is 0.03, in the predicted positive direction but minimal. The negative correlation predicted between religiosity and the up-to-death-posthumous difference for the drug discovery story is also in the predicted direction r (68)= -0.10, but not significant.

The low correlation between religiosity and posthumous effects is somewhat surprising. The reason for this low correlation may be that religions hold different views about the afterlife. Posthumous events should be most relevant for religions with a belief in an afterlife because the afterlife blurs the line of where a life truly ends, makes salient the impact of one's life after death, and introduces the possibility of awareness of posthumous events. Christianity clearly designates an afterlife in which the quality of one's life determines one's afterlife. This is much less the case for some other religions, such as Judaism. Our sample contained 21 Christians (as opposed to other religions or atheist/agnostic, which was one of the alternatives). The Christian subgroup yielded religiosity — posthumous difference correlations that were about the same as that for the entire sample. Religiosity still does not have a significant effect. Of course we did not ask the most critical questions: "Do you believe in an afterlife? Do you believe the quality of your afterlife is related to the quality of your good works on earth? If you believe in an afterlife, do you believe that one can be aware of events after one's death?"

Another reason religiosity may not have correlated is that the mapping from afterlife beliefs to posthumous judgments is much more complex than we had anticipated. We assumed that individuals would be inclined to weigh posthumous events regardless of the valence of the event. The posthumous effect for the drug life, for which the posthumous change is negative (scored as up-to-death — posthumous) should be positive for those who consider posthumous lives relevant, but the score for those same individuals should be negative for the prison story (up-to-death — posthumous). Therefore, insofar as there is a coherent posthumous perspective, we would predict negative correlations between posthumous difference scores for the negative and positive lives. That is, the more posthumous events increase positive evaluations, the more they increase negative evaluations. In fact, for goodness of life, the correlation is 0.16 (n.s.), for happiness, 0.24 (n.s.) and for unhappiness, 0.16 (n.s.); all three are not significant, and in addition, opposite in direction to what a coherent attitude would predict. So it appears that negative and positive posthumous effects are uncorrelated, perhaps contributing to the already substantial literature showing independence of a variety of negative and positive effects (Diener & Emmons, 1985; Watson, Clark, & Tellegen, 1988; Cacioppo & Bernstom, 1994).

3 Study 2

In the second study, we aimed to rule out an alternative account for the posthumous effects that would suggest a life is good if it is viewed as an engaging story. A number of scholars in philosophy (Velleman, 1993; Kupperman, 2006) and psychology (Baerger & McAdams, 1999; King, Hicks et al., 2005) have suggested that lives are like narratives, and that a good life makes a good story. Coherence and ending are both important aspects of the goodness of stories, and hence judgments of lives may be at least in part judgments of the degree of engagement of the audience in a life story.

In an initial attempt to explore this variable, we asked 30 undergraduates to read each of the 18 stories and simply rate: "How good a story is this life?", 0 being equal to "not good at all" and 100 being "as good as possible." Examination of these results indicated that the major influence on this judgment was the valence of the ending of the story (thus, good story meant, to a large degree, good ending). Mean goodness of story and goodness of life (as rated by the participants in Study 1 correlated 0.84). The positively reversed prisoner story rates much higher (mean 51.5) than the negatively reversed drug story (mean 39.9) even though both have similar structure.

To avoid this confound, we ran a second group of participants. We rewrote the question to make clear that "good story" means "how ENGAGING it is, how INTERESTING a movie or book this life story would make." We also correlated the number of words in the story with ratings of the goodness of the life. We believe that despite the research on engaging and good stories, the goodness of a life is not fully explained by the degree to which it is an engaging story, and that this does not account for most of the posthumous effect we report in Study 1. Indeed, if it did, then the drug story with the reversed negative ending would be rated as a better life than the up-to-death version.

3.1 Method

We solicited one more rating of each of the 18 stories from a sample of 38 undergraduates, in the SurveyMonkey format. Participants made only one rating for each story, and were instructed: "How GOOD is the life story. This means how ENGAGING it is, how INTERESTING a movie or book this life story would make." The scale was 0 (not good at all) to 100 (as good as possible).

3.2 Results

As can be seen from Table 2, the engagingness of a story is poorly related to the goodness of the life ratings. The most engaging story was the prisoner reversal story (mean 73.3), but this was the next to lowest goodness of life (mean 41.1). The least engaging story, not surprisingly, was the vanilla story (mean 21.9), but this was rated

Table 2: Goodness of life in relation to goodness and engagingness of story

Story	Rating	Goodness of life (mean)	Engagingness of Story (mean)	Story length (words)
Drug	Up-to-death	87.4	52.1	43.0
discovery	Posthumous	55.4	51.5	81.0
Political	Up-to-death	20.2	40.6	44.0
prisoner	Posthumous	41.1	73.3	68.0

as the second best life (mean 67.2). Across the 17 stories, the correlation between mean engagingness of story from the present study and goodness of life from study 1 was only .06.

Across the 17 stories, story length correlates with goodness of life r = −0.10, and with engagingness of story r = 0.60 (p<0.01). Thus, length does relate to engagingness but not to goodness of life. Since the reversal makes a story longer, there is some confound between length and posthumous events.

Valence of story trumps engagingness when it comes to relation to the goodness of a life. To determine if there was any engagingness effect, we computed correlations separately for the 8 (including the vanilla story) of the 17 stories with positive endings and the 7 with negative endings (leaving out vanilla). With valence factored out in this way, we got correlations between engagingness and good life of r = 0.48 for positive and r = 0.38 for negative outcomes. These nonsignificant correlations suggest that there might be a modest relation between engagingness of story and goodness of life, when holding valence of the ending constant.

3.3 Discussion

Posthumous events reflect on judged goodness of a life. Although somewhat surprised by this finding, there are frameworks within which it is comprehensible. One such framework is simply that a "life" can be construed as not limited to the birth-death period. Common references to "legacies" imply this larger frame. The effect of posthumous events on rated happiness of the life is more difficult to explain.

The happiness (unhappiness) effect is about half of the life goodness effect, but it is significant. That the happiness rating is not the same for the life and posthumous conditions for any individual might result from a general "halo" effect. The changed ending changes the quality of the "life" story, and this general valence change generalizes to the life-limited ratings. It is also possible that some participants did not take happiness to mean something like the summed experienced happiness across

the life span. Another alternative account subsumes the happiness finding under what is called epistemic egocentrism: "a difficulty in setting aside privileged information that one knows to be unavailable to another party" (Royzman, Cassidy & Baron, 2003). In the present case, the knowledge that the participant has of the posthumous outcome of a life is reflected back upon the person in the story, as if the outcome was in some way known to this person.

The correlation between rated happiness of lives and goodness of lives (Study 1) varied between 0.46 and 0.78 (mean of 0.61 for the 17 stories). This reinforces prior theorizing and thinking about the relation between pleasure and meaning. For example, Aristotle (1962) noted that the good life is not just the summed net pleasure, but has a more meaningful component, which he included with the term "eudemonia." Seligman (2002), some 2,000 years later, identified pleasure, meaning and engagement as three basic components of a good life, and examinations of this issue by others also suggests that both pleasure and meaning have to be taken into account (e.g., King & Napa. 1998; King, Eells & Burton, 2005; Kupperman, 2006). Of course, pleasure and meaning are related, as shown in the experimental work of Laura King and her colleagues (King, Hicks, Krull & Del Gaiso, 2006). Sensing meaning can induce pleasure, and a good mood (pleasure) can promote the perception of meaning in one's life.

Religiosity does not appear to be correlated with how much better or worse the life is judged to be with the posthumous reversal as compared to that same life without the posthumous reversal. However, religiosity may be important only when the religion believes in an afterlife. Unfortunately, we did not ask participants their personal belief in an afterlife and cannot fully rule out belief in an afterlife as an alternative explanation of our posthumous effect.

In Study 2 we tested the idea that our effect was a result of posthumous endings creating more engaging and better stories. Our results suggest that engagingness (plot structure) may have some effect on goodness of life, but it is overshadowed by valence of ending. "Good sto-

ries," in the literary domain, are often tragedies. Changes in fortune are often part of good stories. Many people think *Hamlet* is a good story, and surely an engaging one. This leaves open many questions about what is a good story, what is an engaging story, and what this has to do with a good life. Surely, story judgments will have to be more sophisticated than the simple judgments we used here (note for example, the rich conception of story coherence used by McAdams and his colleagues [Baerger & McAdams, 1999]).

Religiosity and quality/engagingness of life narrative seem not to be major predictors of the posthumous effect. This study opens up some questions that will require further empirical study. We believe that, in contemporary American culture, posthumous events really can affect life judgments. We would not be surprised if this effect was bigger in traditional cultures, and might often include the success of one's children after one's death. Our data suggest that these posthumous events may also reflect on perceived life happiness. The latter, more surprising finding surely needs more investigation to control for less interesting accounts.

Given that posthumous events occur after a life is over they represent a good model for understanding how information based on events that occur after the termination of the main event can retroactively affect not only their meaning, but the perception of the individuals happiness during the main event. The posthumous event or the discovery of new information after an event has ended allows for the realization of the event's "true meaning." People are sensitive to the perception that happiness was based on something that turned out to be bad or evil, or conversely, that they suffered for something that turned out to be worthwhile. This sense of false happiness or worthwhile suffering allows for retroactive alteration of one's emotional state.

We refer to this process as retroactive re-evaluation. The demonstration of this "process" at work in posthumous life evaluations may be a special case of a rather common event in normal lives. Often an event occurs that causes us to re-evaluate the meaning of a prior event. For example, one might discover that a reported low examination score was an error in grading, and now reinterpret the memory of receiving the grade. Or one might find out after a wonderful evening with one's partner that he or she was unfaithful. The memory of that very pleasant evening, may now be quite negative. Furthermore, if one changes one's liking for something, or one's attitude about something, this probably affects one's memory of relevant earlier times. Retrospective re-evaluation could be accounted for as an attempt to make a consistent story about one's life, or it may be an example, as mentioned above, of epistemic egocentrism. Thus, the posthumous effect we report may be a special case or an overgeneral-

ization of a common process. But even if this were true, one still needs at least one more assumption (about the limits of a life) to account for the fact that posthumous events influence judgments of the happiness of a life in third party judgments. If one espouses a belief in an afterlife, retroactive re-evaluation in the posthumous case can actually be accomplished by the party in question. But absent an afterlife, or in the presence of an afterlife that does not include reflection on the past, the retroactive re-evaluation that we posit can only take place by a third party. This is quite different from the quite common retroactive re-evaluations that occur by living individuals with respect to their own experiences.

In this presumably more common case, the goodness and even the happiness of prior events can actually change in a first person evaluation.

As reflected in the first sentence of this article, the recruitment of posthumous events has the benefit of improving life evaluations, since almost all lives end on a very negative event (death), and the relevance of posthumous events promises to displace death from its deadly terminal position. Further investigation would surely want to incorporate world-view of individuals, religiosity, and the particular religion (since views of afterlife differ across religions). As well, concerns about mortality, both existential and "momentary", which have been shown to influence all sorts of judgments in the literature on terror management theory (Solomon et al., 2004), might well be relevant to third party quality of whole life judgments.

This study has implications for a wide range of events ranging from relationships to careers, and other life spanning situations. It raises the idea of retrospective re-evaluation. Although by force of circumstances, the present paper had to be evaluated prior to publication, it's ultimate contribution will have to be re- evaluated post-publication.

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