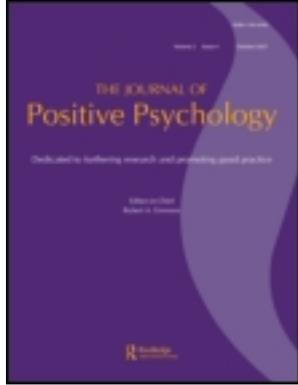


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The Journal of Positive Psychology: Dedicated to furthering research and promoting good practice

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rpos20>

Counterfactual thinking about one's birth enhances well-being judgments

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To cite this article: Samantha J. Heintzelman, Justin Christopher, Jason Trent & Laura A. King (2013): Counterfactual thinking about one's birth enhances well-being judgments, *The Journal of Positive Psychology: Dedicated to furthering research and promoting good practice*, 8:1, 44-49

To link to this article: <http://dx.doi.org/10.1080/17439760.2012.754925>

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Counterfactual thinking about one's birth enhances well-being judgments

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(Received 16 January 2012; final version received 21 November 2012)

Previous research demonstrates that thinking counterfactually about life experiences facilitates meaning making about those events. Two studies extend this work into the well-being domain by examining the effects of writing factually or counterfactually about one's birth on well-being. In Study 1, participants ($N=252$) were randomly assigned to write factually or counterfactually about their births or the election of Barack Obama and then completed measures of meaning in life and life satisfaction. Writing counterfactually about one's birth led to higher evaluations of life relative to all other groups. In Study 2, ($N=98$) participants wrote factually or counterfactually about their births and again completed well-being measures. Fate attributions, probability estimates, and feelings of luck were explored as potential mediators. The effect on well-being from Study 1 replicated, but was not driven by any of the measured variables. Implications for existential psychology and well-being research are discussed.

Keywords: counterfactual thinking; well-being

Counterfactual thinking about one's birth enhances subjective well-being

Counterfactual thinking involves mentally undoing past events (Epstude & Roese, 2008; Summerville & Roese, 2008). This mental exercise can facilitate learning (Epstude & Roese, 2008), enhance cognitive acuity (Kray, Galinsky, & Wong, 2006), and engender emotions ranging from regret (Kahneman & Miller, 1986) to unexpected joy (Koo, Algoe, Wilson, & Gilbert, 2008). Counterfactual thinking about various targets can alter perceptions of those specific entities and experiences. For example, counterfactual thinking about the founding of a nation or an organization enhances patriotism and commitment, respectively (Ersner-Hershfield, Galinsky, Kray, & King, 2010). Kray et al. (2010) extended this work to personal life events and found that individuals who thought counterfactually (vs. factually) about a range of life experiences subsequently attached greater personal meaning and value to those experiences. The present studies examined whether counterfactual thinking applied to an event central to one's existence (i.e. one's birth) would enhance global evaluations of that existence.

Kray et al. (2010) proposed that counterfactual thinking influences evaluations of events by transforming them into 'what was meant to be,' suggesting that counterfactual thinking serves as a means of connecting events to form a coherent whole, allowing the individual to appreciate the rich narrative of life's big picture. Extending these ideas to life itself, we predicted that mentally undoing the very first event of life (i.e. one's

birth) would lead to a heightened sense of that life as meaningful and satisfying. Study 1 sought to establish the effects of thinking counterfactually about one's birth on evaluations of life. Study 2 sought to replicate Study 1 and explore potential mediators of these effects.

Overview and predictions for Study 1

Participants were randomly assigned to write factually or counterfactually about their birth or the election of Barack Obama and completed measures of meaning in life and life satisfaction. This study included the control topic (the election of Barack Obama) to resolve a potential ambiguity in previous research. In the studies by Kray et al. (2010), participants rated only the experience about which they had thought (either factually or counterfactually). Because counterfactual thinking leads to a 'meaning-relevant mindset' (Galinsky, Liljenquist, Kray, & Roese, 2005), it is not clear if participants who had thought counterfactually about one event might have found greater personal meaning in any subsequently considered event. The inclusion of a control topic allowed for an examination of whether counterfactual thinking, per se, leads to enhanced value and meaning or whether this effect is domain specific to the topic of the thoughts.

To examine the specificity of the effects, participants also evaluated a non-self-relevant object, the weather, which we did not expect to differ by condition. For the measures of meaning in life and life satisfaction, we

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predicted a topic X type of thinking interaction, with those who thought counterfactually about their births evaluating their lives most positively.

Study 1

Method

Participants and procedures

Two hundred sixty-seven students (187 women) from an introductory personality psychology class completed an online study as part of a class exercise. They were randomly assigned to the cells of a 2 (topic: own birth vs. election of Barack Obama) X 2 (type of thinking: factual vs. counterfactual) between-participant factorial design.

Following Kray et al. (2010), all participants first wrote a factual account. The instructions read as follows:

There is always a story behind anything that happens to human beings. Think about your own birth (the election of Barack Obama). There are many different events that led up to that event. Take a moment to type about all the events that led up to your birth (the election of Barack Obama).

Participants typed their replies for 5 min. Participants in the factual condition then completed the dependent measures while participants in the counterfactual conditions read the following additional instructions:

Now thinking back on the events that led up to your birth (the election of Barack Obama), please think and type about how each of these events could have turned out differently.

These participants were given additional 5 min to type their replies and then completed the dependent measures.

For the dependent measures, all items were rated on a 1 (not at all) to 7 (extremely much) scale. First, participants completed the five-item presence of meaning subscale from the Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006; $M=4.94$; $SD=1.21$; $\alpha=0.90$; sample item, 'I understand my life's meaning'). Second, participants completed four items adapted from the Purpose in Life questionnaire (PIL; Crumbaugh & Maholick, 1964; King, Hicks, Krull, & Del Gaiso, 2006; McGregor & Little, 1998; $M=5.04$; $SD=1.30$; $\alpha=0.68$; sample item, 'My personal existence is very purposeful and meaningful'). Finally, participants completed the five-item Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985; $M=4.68$; $SD=1.29$; $\alpha=0.89$; sample item, 'I am satisfied with my life').

Finally, participants rated three items assessing satisfaction with the weather, for example, 'Overall, the weather this week has been pleasant' ($M=2.72$; $SD=1.51$; $\alpha=0.87$).

Results and discussion

Examination of the essays

Inspection of the essays revealed that 15 participants in the counterfactual cells either failed to write counterfactually (e.g. writing simply, 'It could not have happened any other way') or failed to write anything during the counterfactual phase. These participants were dropped leaving 252 for the analyses; for the factual groups, Obama $n=79$, own birth $n=62$; and for the counterfactual groups, Obama $n=59$, own birth $n=52$.

Preliminary analyses

For the MLQ and PIL and SWLS, r 's=0.62, and 0.63, respectively. For the PIL and SWLS, $r=0.54$, all p 's<0.0001. To simplify analyses, a composite evaluation measure was calculated, aggregating these three scales ($M=4.98$; $SD=1.08$; $\alpha=0.82$). Weather ratings were not related to the dependent variables, r 's ranged from 0.006 to 0.09, all p 's>0.13. Analyses showed no main effects or interactions involving participant gender.

Main analyses

A 2 (topic: own birth vs. election of Barack Obama) X 2 (type of thinking: factual vs. counterfactual) analysis of variance (ANOVA) was performed on the composite well-being measure. In the absence of main effects (F 's (1, 248)=0.06 and 1.23 for topic and type of thinking, respectively, p 's>0.50), the predicted interaction emerged ($F(1, 248)=5.02$, $p=0.026$, partial $\eta^2=0.02$; see Figure 1). As predicted, thinking counterfactually about one's birth led to higher well-being judgments.¹ A planned contrast showed that the counterfactual/birth cell evaluated their lives more positively than all others, $t(248)=2.20$, $p=0.033$, $d=0.28$. ANOVA on weather ratings revealed no significant effects for topic

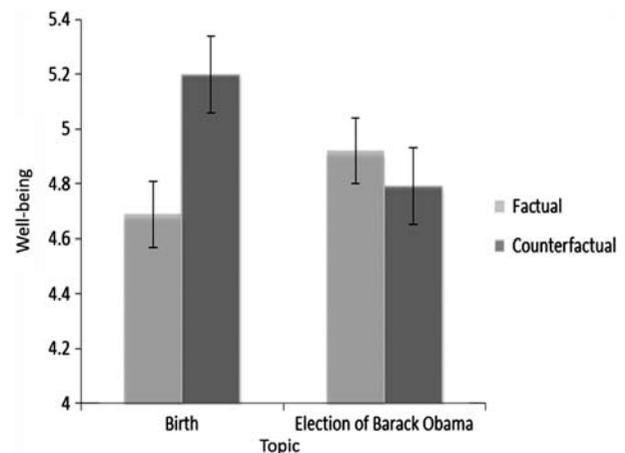


Figure 1. Well-being = composite of the presence of meaning subscale from the MLQ, items from the PIL test, and SWLS. Error bars are standard errors.

($F(1,248)=0.64$, n.s.), type of thinking ($F(1,248)=0.07$, n.s.), or their interaction ($F(1,248)=0.02$, n.s.).

Results of Study 1 support the prediction that thinking counterfactually about one's birth enhances evaluations of life. These results, of course leave open the question of why this was the case. Drawing from findings from the counterfactual literature, we considered three potential mediators of this effect. First, perhaps participants in the counterfactual/own birth condition were more likely to perceive their births as fated. Previous research found that the effect of thinking counterfactually about life experiences on evaluations of those experiences was mediated by the perception that fate intervened to ensure the actual outcome (Ersner-Hershfield et al., 2010; Kray et al., 2010). Likewise, thinking counterfactually might have engendered a sense that the events that led up to one's birth were the result of fate, imbuing life with value and meaning.

Second, it is also possible that thinking about one's birth counterfactually induced a sense of the scarcity of one's existence (King, Hicks, & Abdelkhalik, 2009). The scarcity heuristic suggests that rare commodities are likely to be highly valued (Cialdini, 1993). People commonly overestimate the probability of events that have occurred because these events are more available in memory than all the things that did not happen. Exploring alternate possibilities for events that might be taken for granted as inevitable are cast as more *improbable* and potentially *scarcer* in reality. Participants who thought counterfactually about their births may have come to recognize how very rare a commodity their own existence actually is, and evaluated it accordingly.

Finally, luck could be another mechanism with the potential to drive the relationship between counterfactual thinking and well-being. Counterfactual thinking is a key component in perceptions of luck (Pritchard & Smith, 2004). Situations are generally judged as lucky *by comparison*. Specifically, situations are seen as due to good luck when it is easy to imagine worse possible outcomes (Teigen, 1995). Counterfactual accounts of one's birth might force thoughts of how things could have shifted slightly and jeopardized one's very existence. Perhaps when individuals are faced with alternatives to having been born, they emerge feeling lucky, which could account for the effect of counterfactual thinking on well-being.

Overview and predictions for Study 2

Study 2 examined the effects of thinking factually vs. counterfactually about one's birth on well-being and explored whether three established mediators from the study of counterfactual thinking about narrow life events would generalize to existential thoughts as well. The procedures differed from Study 1 in few key ways. First, participants completed this study in the lab rather

than online. Additionally, in Study 1 all participants wrote a factual account first and only then did the counterfactual participants write the counterfactual essay. To improve the task similarity between the groups in Study 2, all participants wrote a single essay (factual or counterfactual). Next, given the lack of effects of type of thinking on weather ratings and for writing about the election of Barack Obama in Study 1, these features were not included in Study 2. Most importantly, additional measures of the three potential mediators, attributions to fate, probability estimates for the likelihood of one's birth, and feelings of luck, were added.

As in Study 1, we predicted that individuals who wrote about counterfactually about their own births would evaluate their lives more positively than those who wrote factual accounts. Furthermore, we explored fate attributions, probability estimates, and feelings of luck as potential mediators for this effect.

Study 2

Method

Participants and procedures

One hundred twenty-six individuals completed the study in partial fulfillment of research requirements in General Psychology. All procedures were administered by computers located in private cubicles in a laboratory. Participants were randomly assigned to write factually or counterfactually about their births.² Participants were also randomly assigned to complete the dependent measures first or the mediators first.

Dependent measures. Participants completed the SWLS ($M=5.21$; $SD=1.06$; $\alpha=0.85$), MLQ presence of meaning subscale ($M=5.07$; $SD=1.11$; $\alpha=0.86$), and the PIL meaning in life items ($M=5.63$; $SD=0.92$; $\alpha=0.77$).

Potential mediators. Participants completed measures of three potential mediators, including fate ascriptions, probability estimates, and feelings of luck.

Fate ascriptions. Participants were asked to rate on a scale from 1 (not at all) to 7 (extremely) 'How much was your birth the product of fate?' ($M=4.26$; $SD=1.86$).

Probability estimates. To measure the perceived probability of one's birth, participants completed the following item, 'Using a scale from 0 to 100, with 0 meaning not at all probable to 100 meaning completely certain, what was the probability that you would be born?' ($M=66.46$; $SD=31.22$).

Luck. Finally, participants completed two items to tap into feelings of luck. First, they were asked to rate on a scale from 1 (not at all) to 7 (extremely) how lucky they felt ($M=3.78$; $SD=1.74$). Second, they were asked to imagine being entered into a random lottery with 100 others and then to rate on a scale from 0 to 100 how likely it is that they would win ($M=5.17$; $SD=13.38$).

Results and discussion

Examination of the essays

Inspection of the essays revealed that six participants in the factual condition spontaneously generated counterfactual essays. In addition, 22 participants in the counterfactual cell either wrote factually or wrote about a completely unrelated topic. We note that the number of participants who were dropped from the counterfactual condition is rather large, relative to those in factual condition in Study 2, as well as both conditions in Study 1. In Study 1, all participants first wrote a factual essay and this may account for the fact that far fewer participants in that study wrote a factual essay in the counterfactual condition. Although we made this change in the procedures to improve the similarity between the two conditions, it may have had the unanticipated effect of lower clarity for participants in the counterfactual condition. In any case, these participants were dropped leaving 57 participants in the factual condition and 41 in the counterfactual condition.³

Preliminary analyses

For the MLQ and the PIL and SWLS, r 's = 0.63 and 0.26, respectively. For the PIL and SWLS, $r = 0.32$, all p 's < 0.01. Once again, a composite well-being evaluation measure was calculated, aggregating these three scales ($\alpha = 0.87$; $M = 5.31$; $SD = 0.80$). No main effects or interactions for participant sex or order of administration were observed, so analyses were collapsed across these variables.

Main analyses

As in Study 1, writing counterfactually about one's birth led to higher overall well-being ($M = 5.51$; $SD = 0.61$) compared to writing factually ($M = 5.16$; $SD = 0.89$), $t(96) = 2.13$, $p = 0.036$, $d = 0.46$. Next, analyses turned to the potential mediators of this effect. There were no significant differences between groups on these variables. Individuals who wrote counterfactually did not rate their lives as more fated ($M = 4.41$; $SD = 1.75$) than individuals who wrote factually ($M = 4.14$; $SD = 1.95$), $t(96) = 0.717$, *n.s.*, $d = 0.15$. Probability estimates for their births did not differ between the counterfactual ($M = 65.88$; $SD = 31.84$) and the factual groups ($M = 66.88$; $SD = 31.04$), $t(96) = 0.16$, *n.s.*, $d = 0.03$. Ratings of luck did not differ between the two groups (M 's, SD 's = 3.56, 1.58 vs. 3.93, 1.84, for counterfactual vs. factual groups, $t(96) = 1.037$, *n.s.*, $d = 0.22$). On estimates of the likelihood of winning a 1 in 100 lottery, heterogeneity of variance across the groups precluded a straightforward comparison. Instead, we examined whether the counterfactual group was more likely to estimate their likelihood of winning as higher than the actual odds of winning (1 in 100). The mean estimates significantly differed from 1 for both the factual

group (5.09; $SD = 15.03$; $t(56) = 2.054$, $p = 0.045$, $d = 0.55$) and the counterfactual group (5.29; $SD = 10.86$; $t(40) = 2.530$, $p = 0.015$, $d = 0.80$). Thus, regardless of condition, participants overestimated their odds of winning. As these variables did not differ between the groups, fate, probability, and luck cannot mediate the relationship between counterfactual thinking and well-being. Though replicating the results of Study 1, the results of Study 2 failed to support any of the proposed mediators. Rather, for all participants, lives were judged as fated and probable, and participants in general felt pretty lucky. We discuss the implications of these results below.

General discussion

Results from two studies support the prediction that thinking counterfactually about one's birth leads to enhanced well-being judgments. These results show that effects of counterfactual thinking generalize beyond evaluations of circumscribed life experiences or momentary affect to global measures of well-being. Results also point to the specificity of these effects. Ratings of the weather were not influenced by the manipulations and participants who thought counterfactually about an unrelated topic (the election of Barack Obama) did not show enhanced evaluations of life. Life evaluations are not affected by the act of thinking counterfactually, *per se*. Rather, thinking counterfactually about a topic that is relevant to the target of evaluation, influences (only) evaluations of that target, bolstering the results of studies by Kray et al. (2010). In addition, Study 2 explored potential explanatory mechanisms for this effect. No significant differences emerged on any of these measures, suggesting that writing counterfactually about one's birth may be different in important ways from writing counterfactually about other experiences, as we now consider for each of our potential mediators.

Based on past research, we tested fate ascriptions for one's birth as the mechanism driving the relationship between type of thinking and life evaluations. The attribution of one's birth to fate did not differ between the two groups and thus did not mediate the effect, in contrast to previous findings on thinking counterfactually about life events (Ersner-Hershfield et al., 2010; Kray et al., 2010). Generally, 75% of people believe that events can be determined by fate (Burrus & Roeser, 2006). Such fate ascriptions tend to be especially high when the event is perceived as abstract (Burrus & Roeser, 2006). The events surrounding one's birth are necessarily abstract as the individual was not present, and thus, fate ascriptions for this event are likely to be high, regardless of type of thinking. Indeed, comparing the mean ascriptions of fate between the two studies (converting both to a common 7-point scale) shows that fate ascriptions for one's birth (5.09 and 5.29 for factual and counterfactual groups, respectively) were higher than fate ascriptions given for other important life events (3.30 and 4.48;

Kray et al., 2010). With these generally high fate ascriptions for our topic of interest, it seems that one's birth may be generally attributed to fate.

We also examined the estimates that individuals assigned to the probability of their own births after they wrote either factually or counterfactually about that very topic. The data did not support our prediction that these estimates would explain the effect. The absence of this predicted relationship suggests, again, important properties of the topic of one's birth. Previous research has shown that some events are too vivid to be counterfactually undone (Teigen & Jensen, 2011). It is reasonable to suggest that with the self-involved topic of one's birth, the inescapable knowledge that one was, in fact, born, trumps the effects of thinking about the alternatives as viable options. It is hard to imagine life without ourselves when the glaring reality of our existence remains.

The potency of counterfactual thoughts to impact outcome variables consists of both the 'if likelihood' and the 'then likelihood' of the counterfactual account (Petrocelli, Percy, Sherman, & Tormala, 2011). Whereas strong counterfactual accounts consist of counterfactual antecedents *and* counterfactual outcomes, one can also form semifactual accounts of events. Such semifactuals consist of 'even if' thoughts in which the antecedent is counterfactual, but the outcome aligns with reality (McCloy & Byrne, 2002). For example, the person who forgot an umbrella could think, 'Even if I had remembered to bring my umbrella I still would have gotten wet in this sideways rain.' Given the salience of one's existence, it is possible that the participants rendered semifactual accounts of their own births, reporting counterfactual antecedents to their births, but stopping short of truly undoing the outcome of being born.

Finally, we considered luck as another potential mediator of the effect. Whether measured by simple self-report or in estimates of the likelihood of winning a lottery, perceptions of luck did not differ between the two groups so this variable did not mediate the increase of well-being following counterfactual thinking. Typically, luck ascriptions are made when the alternatives can be rationally expected (Pritchard & Smith, 2004) and when worse possible outcomes are easily imagined (Teigen, 1995). The closer the worst possible scenario is to becoming reality, the luckier positive events are regarded (Pritchard & Smith, 2004; Teigen, 1996). As discussed above, this may have not been the case for our existentially challenging manipulation where the alternate possibility of not being born is not easily imagined and is certainly not a close possible world. Although people do attribute stable aspects of their lives (e.g. family and educational opportunities) to good luck by comparing these outcomes to the potential for worse outcomes (Teigen, 1996; Teigen, 1997), it seems that the matter of one's existence is judged as similarly lucky regardless of the induced salience of the alternative.

Apparently, unlike other targets of counterfactual thinking, one's personal existence is generally considered to be fated, highly probable, and lucky. The present results then demonstrate a rather strong case for the influence of counterfactual thinking on well-being judgments: even for targets that are presumably high on fate, probability, and luck, counterfactual thinking can increase their value.

The fact that differences emerged between the factual and the counterfactual thinking groups on well-being judgments but not on these potential mediators suggests a potentially unique effect of such thinking on overall evaluations of life. What else might explain the enhancement of life evaluations as a function of type of thinking? It might be that increased life evaluations following counterfactual thinking about one's birth are driven by defensive processes in response to threat. An intriguing tie can be made between the thoughts of never having been born in the current study to the more widely studied manipulation of mortality salience in that both present a potential existential threat. Terror management theory explores humans' fear of death and various social mechanisms used to buffer against threats of one's eventual demise (TMT; Solomon, Greenberg, & Pyszczynski, 1991). Interestingly, such threats can lead to increased life evaluations for individuals with a high need for structure (Vess, Routledge, Landau, & Arndt, 2009). Further, reminders of death can enhance well-being judgments (King et al., 2009). It may be that in mentally undoing their births, participants were confronted with the possibility of their own nonexistence and evaluated their lives more positively to compensate for that threat.

Future research might expand on the outcomes considered here and include other variables that might be influenced by thinking counterfactually about one's birth to tease out the potential role of threat. Specifically, research might examine whether thinking counterfactually about one's birth influences endorsement of one's cultural worldview or self-esteem (as might be predicted by TMT). In addition, it might be interesting to explore attitudes toward the individuals involved in that event, especially one's parents. Thinking counterfactually about the events that led to one's existence might increase appreciation not only for that existence but also for the characters who played an active role in those events.

The present results move counterfactual thinking into the realm of existential thought. Our findings suggest that regardless of whether we can truly 'unthink' our very existence, entertaining the idea has widespread impact on important life evaluations. Considering the ways that the antecedents to one's birth could have transpired differently makes life seem more satisfying and meaningful.

Acknowledgments

Study 1 was conducted in partial fulfillment of the requirements for the Master's degree in Psychology at the University of

Missouri, Columbia, by Justin Abdelkhalik (Christopher) under the direction of Laura King. We thank Dan Turbin and Amanda Rose for their helpful comments throughout the project. This research was supported by NSF Grant 1036447.

Notes

1. Word counts revealed no differences in the number of words for factual writing by topic (M 's=29 vs. 32 for Obama vs. own birth, respectively), $t(251)=0.70$, n.s., or counterfactual writing (M 's=35 vs. 39; $SD=27$), $t(110)=0.72$, n.s. The counterfactual groups differed from the factual groups in that they were required to write more, however, the effect of topic \times type of thinking on well-being remained significant controlling for total words written, $F(1, 246)=5.05$, $p=0.026$, partial $\eta^2=0.02$.
2. Given the methodological changes, the instructions for the counterfactual condition were altered somewhat, now reading: 'There is always a story behind anything that happens to human beings. For example, think about your birth. There are many key events that led up to that event and people who played pivotal roles along the way. Keeping in mind all of these key events, please write down how each of these events could have turned out differently.'
3. As in Study 1, word counts were computed in Study 2, revealing no significant differences in the number of words between the factual writing group ($M=96.87$) and the counterfactual group ($M=108.98$), $t(96)=1.25$, n.s.

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