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Working Paper

The Benefits of Believing in Chance or Fate: External Locus of Control as a Protective Factor for Coping with the Death of a Spouse

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317

Jule Specht • Boris Egloff • Stefan C. Schmukle

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**The Benefits of Believing in Chance or Fate:
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Abstract

The death of a spouse is an extremely stressful life event that consequently causes a large drop in life satisfaction. Reactivity to the loss, however, varies markedly, a phenomenon that is currently not well understood. Because lack of controllability essentially contributes to the stressful nature of this incident, we analyzed whether individual differences in the belief in external control influence the coping process. To examine this issue, widowed individuals ($N = 414$) from a large-scaled panel study were followed for the 4 years before and after the loss by using a latent growth model. Results showed that belief in external control led to a considerably smaller decline in life satisfaction and higher scores in the year of the loss. Thus, although usually regarded as a risk factor, belief in external control acts as a protective factor for coping with the death of a spouse.

Keywords: locus of control, life satisfaction, latent growth model, subjective well-being, subjective indicators, family and networks

Introduction

Lay persons and researchers agree that the death of a spouse is one of the worst things that can occur in life (Holmes & Rahe, 1967). Consequently, most people show a large drop in life satisfaction as a result of this tragic event. There is, however, marked variation across the widowed in their reactivity to the loss. This variation is currently not well understood (Lucas, Clark, Georgellis, & Diener, 2003). Because lack of controllability contributes to the stressful nature of this incident in an important way, we analyzed whether belief in external control acts as a protective factor for coping with the death of a spouse.

Rotter (1966) introduced the construct *locus of control* to represent interindividual differences in the generalized belief in external and internal control. Individuals with a belief in external control interpret events to be the result of surrounding forces, such as luck, chance, or fate, whereas individuals with a belief in internal control perceive events as contingent upon their behavior. Usually, generalized belief in external control is associated with undesirable outcomes, for instance, lower satisfaction with life (DeNeve & Cooper, 1998), mental-health problems (Benassi, Sweeney, & Dufour, 1988), a worse course of physical diseases (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000), and less academic success (Prociuk & Breen, 1975).¹

To the contrary, however, external locus of control may be beneficial at certain times: Confronted with uncontrollable life events, individuals with a high belief in external control (high externals) should have more realistic expectations in this specific situation than individuals with a low belief in external control (low externals). Consequently, high externals should be less vulnerable to the death of a spouse—an uncontrollable and particularly stressful life event—because they are able to cope more effectively with it

(Wortman, Sheedy, Gluhoski, & Kessler, 1992). By contrast, the worldview of low externals should be threatened by this event because they have to painfully recognize the impact of uncontrollable forces. Thus, our assumption is that high belief in external control soothes the reactivity to this event, resulting in a comparatively smaller decrease in life satisfaction, whereas low belief in external control leads to a larger drop in life satisfaction as a reaction to this irrevocable loss.

To analyze this issue, we used data from a large-scaled panel study with a nationally representative sample that were obtained yearly for a long period of time. This approach offered several advantages: (a) Because of the large sample size of the panel, even rare events such as the death of a spouse could be analyzed with adequate power; (b) The large number of measurement occasions allowed us to follow participants for several years before and after the event and thus to give a differentiated overview of the course of life satisfaction; and (c) Most importantly, the prospective design of this study allowed us to avoid the risk of retrospective biases in data surveyed after the major life event. That is, participants' life satisfaction and control beliefs had already been assessed before the death of the spouse.

Method

Participants

The data used in this study were provided by the German Socio-Economic Panel Study (SOEP), a longitudinal survey of private households in Germany (see Wagner, Frick, & Schupp, 2007, for details). Information was obtained yearly, mostly from face-to-face interviews with all adult members of chosen households, which were selected using multistage random sampling. Participants with complete answers for locus of control in at least one of the years 1994 to 1996 were used for our analysis ($N = 14,708$).

Four hundred twenty-four of those participants reported the death of a spouse in the years after the measurement of locus of control (1997 to 2007). Two individuals were excluded on account of getting widowed repeatedly, and another eight individuals were excluded because of inconsistent information. Thus, the final sample consisted of 414 participants (287 women) with an average age of 64.95 years ($SD = 12.48$, range: 30-91).²

Measures

In each of the years 1994 to 1996, locus of control was measured using an 8-item scale, which was based on the scale by Rotter (1966). Participants were asked to indicate their agreement with each of the items on a scale ranging from 1 (*applies completely*) to 4 (*does not apply*), which were recoded so that high values indicated affirmation. In accordance with previous research (Carver, 1997), we found a clear 2-factor solution with internal and external control items each loading highly on their respective factors. The factor *external control* contained five items (e.g., *I think that no one can escape his/her fate. Everything in life happens as it should*), and was reasonably reliable with a mean internal consistency of Cronbach's alpha = .76 and a mean stability across 1 year of $r = .62$.

The factor *internal control* contained three items (e.g., *My life is determined by my behavior*), and showed the following reliabilities (yearly averages): internal consistency: $\alpha = .59$, stability: $r = .47$. To adjust for the moderate stability coefficients common for short questionnaires in large longitudinal surveys, we used the variance that was stable across the three consecutive measures of locus of control in subsequent analyses.

A yearly measurement of satisfaction with life (*How happy are you at present with your life as a whole?*) on an 11-point-scale ranging from 0 (*totally unhappy*) to 10 (*totally happy*) was used as the dependent variable. We extracted information from 4 years before to 4 years after the event³. Mean affirmation for the complete SOEP sample ranged from 6.79 to 7.10 in the years under analysis (1993 to 2007) with a standard deviation ranging from 1.74 to 1.88. Extracted data were then centered around the yearly mean to account for average trends over time (see Lucas et al., 2003)⁴ and recorded relative to the year in which the spouse died. Because our unbalanced panel design allowed missing data, sample sizes ranged from 206 to 413 per year.

Statistical Model

In order to investigate the course of satisfaction relative to the death of the spouse, a *nonlinear latent growth model* was used (Figure 1; see also Bollen & Curran, 2006). Scores of life satisfaction 4 years before to 4 years after the death of the spouse served as dependent variables (ls_{-4} to ls_{+4}). The intercept (i) reflected the baseline level of satisfaction and the slope (s) was used to model the reaction to the spouse's death. The loading of life satisfaction on the slope was fixed to 0 four years before the death (baseline level) and fixed to -1 for the year in which the spouse died (indicating the lowest level of life satisfaction). All other loadings were freely estimated in order to adequately model the

nonlinearity of the growth process (Meredith & Tisak, 1990).⁵ As an alternative, we tested a model in which the loading of life satisfaction on the slope was additionally fixed to 0 four years after the death. This alternative model assumed that the average life satisfaction increased to the baseline level within the first 4 years after the loss.

Then the effects of internal and external control on the intercept and the slope were analyzed. To control for demographic background variables, age and sex were included as covariates. The model was estimated with Mplus Version 5.1 (Muthén & Muthén, 1998-2007) by using the full information maximum likelihood method that allows for missing data. Evaluation of model fit was based on multiple criteria. The χ^2 model test statistic is problematic because the probability of rejecting any model increases with an increase in sample size. As a consequence, alternative measures of model fit, so-called fit indices, have been recommended for evaluating model fit. As shown by simulation studies, a comparative fit index (CFI) above .95, a root-mean-square error of approximation (RMSEA) below .06, and a standardized root-mean-square residual (SRMR) below .08 are indicators of good model fit (Hu & Bentler, 1998). Similarly, for comparison of our two nested models, we used the Bayesian Information Criterion (BIC) in addition to the χ^2 difference test.

The change in life satisfaction as a consequence of the death of the spouse was calculated as the difference between satisfaction at the baseline level (4 years before the event) and satisfaction in the year in which the spouse died. To standardize these measures, effect sizes were determined using the standard deviation of satisfaction at the baseline level of 1.85 (cf. Lucas, 2007b). Those effect sizes reflect the change of satisfaction relative to the variability in the selected population before the event.⁶

Results

The nonlinear latent growth model (Figure 1) fit the data very well, χ^2 (113, $N = 414$) = 182.65, $p < .001$, CFI = .964, RMSEA = .039, SRMR = .041, BIC = 19361. Furthermore, this model had a significantly better fit than the alternative model with the additional constraint of a zero loading of life satisfaction 4 years after the loss (ls_{+4}) on the slope, χ^2_{diff} (1, $N = 414$) = 11.75, $p < .001$, BIC = 19367, indicating that the average life satisfaction at the end of our observation period was still lower than the baseline level.

The diamond-labeled middle line in Figure 2 demonstrates the modeled run of satisfaction for individuals with an average belief in external control. One can easily reproduce the connection between Figures 1 and 2 by using the following formula:

$$ls_t = M_i + b_s \cdot M_s$$

where t indicates the point of time relative to the death of the spouse and b_s is the growth parameter of the slope (s). For ease of understanding, we adopt this exemplarily for the year 0 (the year of the loss), where the growth parameter of the slope b_s is fixed to -1: $ls_0 = -0.35 + (-1) \cdot 1.22 = -1.57$.

Locus of control was measured for three consecutive years (1994, 1995, and 1996). The stable variances of internal and external control were included in the model as latent variables (their factor loadings are given in Figure 1). Belief in external control had a highly significant negative effect on the intercept, $b_{ext\ on\ i} = -0.26$, $p = .007$, reflecting a lower level of satisfaction in general. Most importantly, external control predicted a smaller decrease in life satisfaction in reaction to the spouse's death, $b_{ext\ on\ s} = -0.48$, $p < .001$. Figure 2 illustrates this relationship: It compares the predicted run for individuals with high belief in external control (one standard deviation above the mean) and low belief in external

control (one standard deviation below the mean) with individuals reporting average belief in external control. Again, one can easily reproduce the connection between Figures 1 and 2 by adding the influence of external control into the aforementioned formula:

$$ls_t = M_i + b_{\text{ext on } i} \cdot \text{ext} + b_s \cdot (M_s + b_{\text{ext on } s} \cdot \text{ext})$$

where t indicates the point of time, $b_{\text{ext on } i}$ the influence of ext on the intercept, ext the extent of belief in external control, b_s the growth parameter of the slope and $b_{\text{ext on } s}$ the influence of ext on the slope. If one is interested in the run of satisfaction for individuals with high belief in external control (e.g., 1 *SD* above the average belief in external control), ext equals 1 and the formula for the exemplarily chosen year 0 is the following: $ls_0 = -0.35 + (-0.26) \cdot 1 + (-1) \cdot (1.22 + (-0.48) \cdot 1) = -1.35$.

Overall, participants with an average belief in external control reported a drop in life satisfaction of 1.22 points, which corresponds to an effect size of $d = 0.66$. Hence, individuals show quite a large drop because of the death of their spouse. The decline of satisfaction already starts 1 year before the death of the spouse, implying that death might be preceded by a long-lasting illness. In the year of the death, participants reported the lowest satisfaction with life, whereas satisfaction had already clearly increased 1 year after. Predicted levels of high externals sank only 0.74 points ($d = 0.40$). By contrast, the predicted loss of low externals was 1.70 points ($d = 0.91$), which is more than twice the drop of high externals. Accordingly, the reactivity to this event was strongly dependent on the belief in external locus of control, resulting in either a medium-sized or a very large decline in life satisfaction.

Similar to the drop of life satisfaction leading up to the event, the rise of satisfaction during the 4 years afterward differed depending on the belief in external control.

Participants with an average belief in external control reported an increase of satisfaction of 0.91 points ($d = 0.49$). The predicted increase of high externals was 0.55 ($d = 0.30$), whereas low externals had a predicted increase of 1.27 ($d = 0.68$). Compared to the baseline level of satisfaction with life, individuals with an average belief in external control reported a still existing gap of satisfaction of 0.31 points ($d = 0.17$) 4 years after the event. The predicted gaps were 0.19 points ($d = 0.10$) for high externals and 0.43 points ($d = 0.23$) for low externals.

As shown in Figure 1, belief in internal control had a highly significant effect on the intercept, $b_{\text{int on i}} = 0.45$, $p < .001$, indicating higher life satisfaction in general. There were, however, no significant effects on the course of satisfaction, $b_{\text{int on s}} = -0.10$, $p = .47$. Age as well as sex, accounted for as covariates, did not have significant effects on the slope or on the intercept.⁷

Discussion

The current study showed that the death of a spouse is a very stressful life event that causes a large drop in life satisfaction. Overall, satisfaction with life had already declined in the year before the loss, reached a minimum—considerably lower than the baseline level—in the year of the death, and increased slowly in the years thereafter, although it failed to reach the baseline level within 4 years. These findings correspond to those reported by Lucas et al. (2003; see also Lucas 2007a) who used another sample from the SOEP data (containing participants who lost their spouses between 1986 and 1996), and who found that, on average, individuals do not reach their baseline level until the 8th year of widowhood.

Most importantly, our findings demonstrate that the great variability in coping with the spouse's death can be explained by individual differences in the generalized belief of locus of control: As predicted, high externals experienced a considerably smaller decline in satisfaction in the years preceding and following the deaths of their spouses than did low externals. Additionally, although high externals began at lower levels of life satisfaction, they reported more satisfaction in the year of the loss than those who scored low on this dimension. The latter advantage for high externals, however, was found only in the year of the loss. Albeit the rise of satisfaction after the death of the spouse was stronger for low externals, they considerably failed to reach their baseline level in the years after, whereas high externals had almost reached their general level of life satisfaction after only 4 years. This means that, dependent on the reference value, high externals either do have an advantage in the years before and after the loss (because their drop of life satisfaction is more shallow) or do not (because their absolute level of life satisfaction is partly beneath

the one of the low externals). Nevertheless, independent of the reference value, belief in external control, which is commonly regarded as a risk factor, definitely acts as a protective factor in the year of the loss.

We suppose that individuals who generally expect major life events to be mainly driven by external forces cope more effectively with this uncontrollable event because they more easily accept their lack of control and their own helplessness. On the contrary, individuals who generally underestimate the impact of uncontrollable forces need to realize the impact of chance and fate and, thus, not only need to cope with the loss, but also need to question or modify their worldview above all.

In contrast to the belief in external control, belief in internal control did not moderate the effect of the spouse's death on life satisfaction. We suppose that this is due to the uncontrollability of this specific situation and that reactions to more controllable events should be increasingly affected by belief in internal control. Problem-focused coping (Lazarus & Folkman, 1984) is an effective strategy in controllable situations, and hence, high internals should have an advantage there because they use behavioral coping strategies aimed at solving the problem.

To conclude, our study indicates that when faced with an uncontrollable and extremely stressful event, such as the death of a spouse, generalized belief in external control is a protective factor, and thus its negative reputation should be reappraised. Hence, this finding might constitute an important addition for models that conceptualize individual difference variables as risk factors or resources in coping with loss (e.g., Mancini & Bonanno, 2009; Stroebe, Folkman, Hansson, & Schut, 2006).

References

- Benassi, V. A., Sweeney, P. D., & Dufour, C. L. (1988). Is there a relationship between locus of control orientation and depression? *Journal of Abnormal Psychology, 97*, 357-367.
- Bollen, K. A., & Curran, P. J. (2006). *Latent curve models: A structural equation perspective*. Hoboken, NJ: Wiley.
- Carver, C. S. (1997). The Internal-External Scale Confounds Internal Locus of Control with Expectancies of Positive Outcomes. *Personality and Social Psychology Bulletin, 23*, 580-585.
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124*, 197-229.
- Ellison, C. G. (1991). Religious involvement and subjective well-being. *Journal of Health and Social Behavior, 32*, 80-99.
- Folkman, S. (1984). Personal control and stress and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46*(4), 839-852.
- Holmes, T. H., & Rahe, R. H. (1967). The social readjustment rating scale. *Journal of Psychosomatic Research, 11*, 213-218.
- Hu, L.T., & Bentler, P.M. (1998). Fit indices in covariance structure modeling: sensitivity to underparameterized model misspecification. *Psychological Methods, 3*, 424-453.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York: Springer.
- Lucas, R. E. (2007a). Adaptation and the set-point model of subjective well-being: Does happiness change after major life events? *Current Directions in Psychological Science, 16*, 75-80.

- Lucas, R. E. (2007b). Long-term disability is associated with lasting changes in subjective well-being: Evidence from two nationally representative longitudinal studies. *Journal of Personality and Social Psychology, 92*, 717-730
- Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology, 84*, 527-539.
- Mancini, A. D., & Bonanno, G. A. (2009). Predictors and parameters of resilience to loss: Toward an individual differences model. *Journal of Personality, 77*, 1805-1831.
- Meredith, W., & Tisak, J. (1990). Latent curve analysis. *Psychometrika, 55*, 107-122.
- Muthén, L. K., & Muthén, B. O. (1998 – 2007). *Mplus user's guide* (5th ed.). Los Angeles, CA: Muthén & Muthén.
- Norenzayan, A., & Lee, A. (2010). It was meant to happen: Explaining Cultural Variations in Fate Attributions. *Journal of Personality and Social Psychology, 98*(5), 702-720.
- Prociuk, T. J., & Breen, L. J. (1975). Defensive externality and its relation to academic performance. *Journal of Personality and Social Psychology, 31*, 549-556.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied, 80*, 1-28.
- Stroebe, M. S., Folkman, S., Hansson, R. O., & Schut, H. (2006). The prediction of bereavement outcome: Development of an integrative risk factor framework. *Social Science & Medicine, 63*, 2440-2451.
- Taylor, S. E., Kemeny, M. E., Reed, G. M., Bower, J. E., & Gruenewald, T. L. (2000). Psychological resources, positive illusions, and health. *American Psychologist, 55*, 99–109.

Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP) - Scope, evolution and enhancements. *Journal of Applied Social Science Studies*, *127*, 139-169.

Wortman, C. B., Sheedy, C., Gluhoski, V., & Kessler, R. (1992). Stress, coping, and health: Conceptual issues and directions for future research. In H. S. Friedman (Ed.), *Hostility, coping, and health* (pp. 227-256). Washington, DC: American Psychological Association.

Footnotes

¹Apart from the generalized belief in external and internal locus of control, a wide range of more detailed and situation-specific concepts of locus of control were investigated, which need to be distinguished from the generalized personality trait described above (Folkman, 1984).

²Most of those answered the locus of control questionnaire for all three years (358 individuals, 86%), whereas only 31 (7%) answered for two years and only 25 (6%) for one year.

³This time interval enables, on the one hand, a differentiated view of the run of satisfaction over time, and ensures, on the other hand, an adequate sample size.

⁴We reran the analysis with the uncentered satisfaction scores, and results remained approximately constant.

⁵Compared to a quadratic or higher-order polynomial nonlinear latent growth model, this model has the advantage that effects of variables on growth parameters can be interpreted more easily because there is just one rather than two or more different slope parameters.

⁶Alternatively, the average variability of life satisfaction within each person in the run of several years, independent of a major life event, could serve as a relevant standard deviation. Because this value is smaller, all effect sizes would be greater than those reported here.

⁷Religiousness, associated with life satisfaction (Ellison, 1991) as well as with external locus of control (Norenzayan & Lee, 2010), was measured in 1994 with a single question on a 4-point-scale. When modeling the run of life satisfaction for religiousness

alone (without accounting for the belief in locus of control), there was an effect on the intercept ($b_{\text{rel on i}} = .27, p = .001$), meaning that religious individuals are more satisfied in general, but there was no effect on the slope ($b_{\text{rel on s}} = .19, p = .10$). This means that the effect of external control cannot be explained by religiousness. When locus of control and religiousness were both included in one model, we observed the expected positive correlation between religiousness and external locus of control ($r = .12, p = .02$). Additionally, there were significant effects of religiousness on both the intercept ($b = .30, p < .001$) and the slope ($b = .22, p = .04$). Interestingly, the latter result suggests that religious individuals report a larger drop in life satisfaction than do less religious individuals when controlling for the general belief in locus of control.

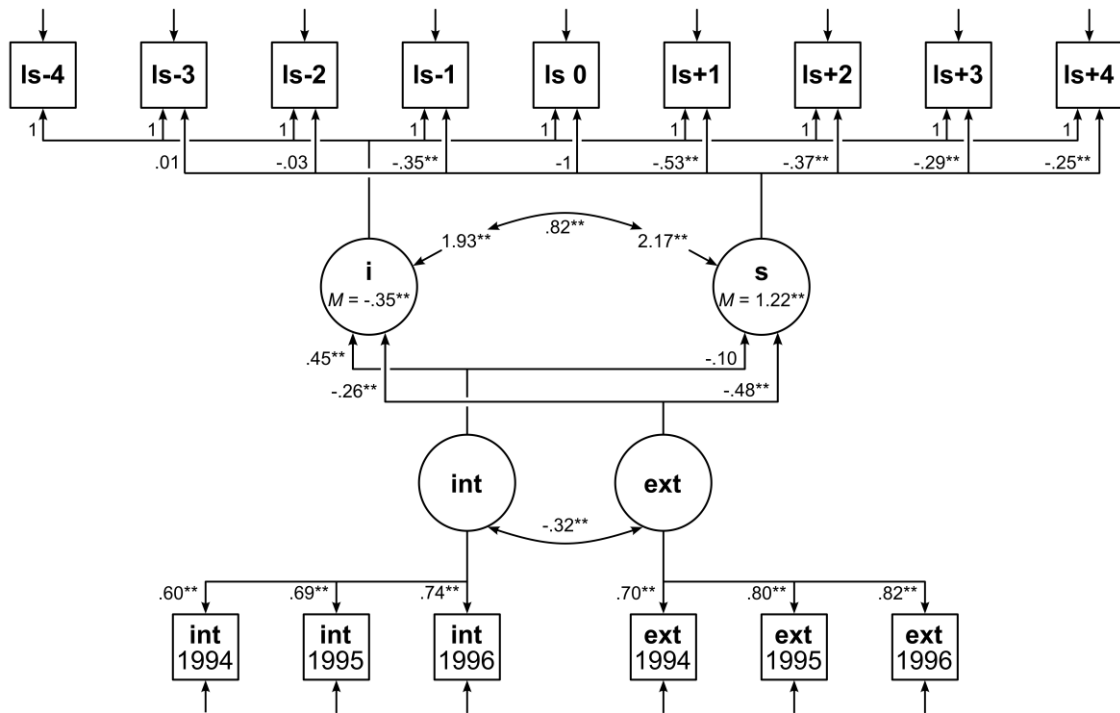


Figure 1. Nonlinear latent growth model with one intercept (*i*) and one slope (*s*) modeling the run of life satisfaction from 4 years before to 4 years after the spouse's death (ls-4 to ls4). For ease of interpretation, latent variances of internal (*int*) and external (*ext*) locus of control are set to 1, and factor loadings for *int* and *ext* are standardized, whereas unstandardized values are presented for path coefficients and latent growth parameters (results are controlled for sex and age). $N = 414$.

** $p < .01$.

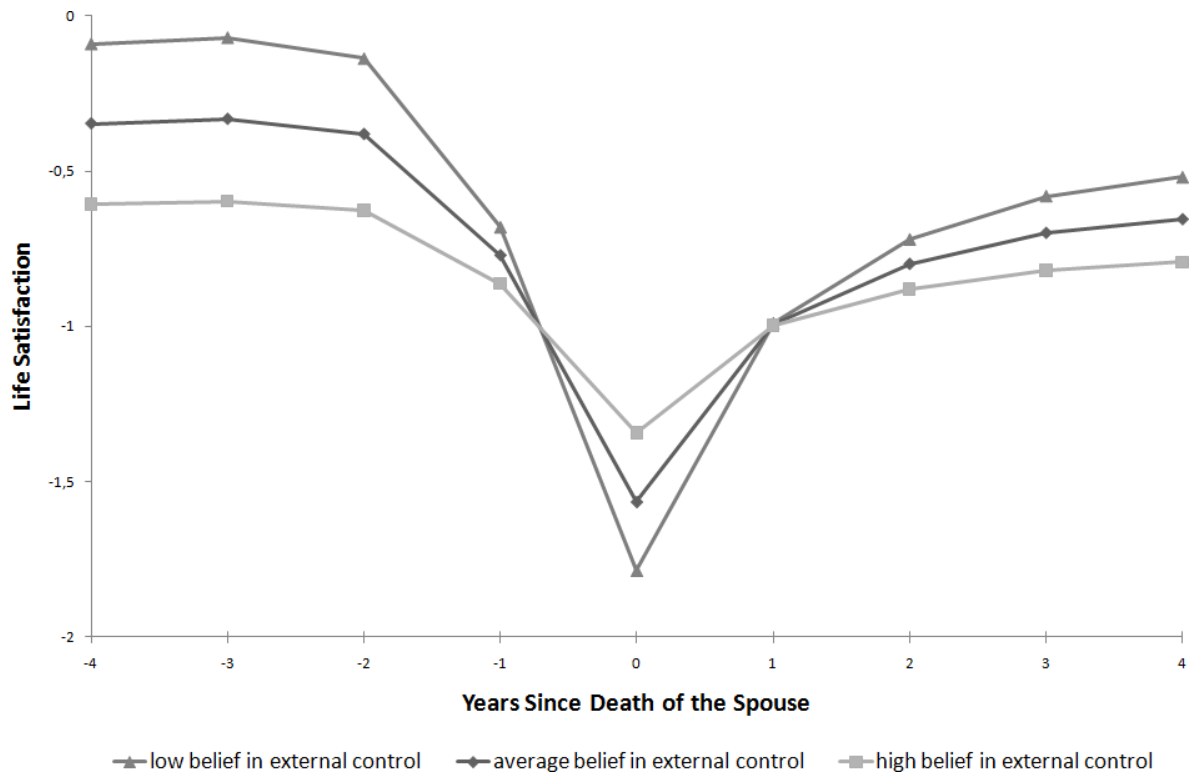


Figure 2. Predicted changes in life satisfaction in the 4 years before and after the death of the spouse presented separately for individuals with average, high (one standard deviation above mean), or low (one standard deviation below mean) beliefs in external control. Scores for life satisfaction are centered around the yearly mean to account for average trends over time. $N = 414$.