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Working Paper

Institutional rearing is associated with lower general life satisfaction in adulthood

SOEPpapers on Multidisciplinary Panel Data Research, No. 616

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Richter, David; Lemola, Sakari (2013) : Institutional rearing is associated with lower general life satisfaction in adulthood, SOEPpapers on Multidisciplinary Panel Data Research, No. 616, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at:

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616-2013

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with lower general life satisfaction in
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David Richter and Sakari Lemola

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ISSN: 1864-6689 (online)

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Published as: Richter, D. & Lemola, S. (2014). Institutional rearing is associated with lower general life satisfaction in adulthood. *Journal of Research in Personality*, 48, 93-97.

<http://dx.doi.org/10.1016/j.jrp.2013.11.001>

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Keywords: life satisfaction; set point theory; early adversity; institutional rearing

Abstract

We analyzed whether individuals reared in institutions differ in their general life satisfaction from people raised in their families. The data comprised of 19,210 German adults (51.5% female) aged from 17 to 101 years and were provided by the SOEP, an ongoing, nationally representative longitudinal study in Germany. Compared to people raised in families, individuals reared in institutions reported lower general life satisfaction in the manner of a dose response relationship controlling their parents' education and occupational prestige. The association was moderated by participants' age such that with increasing age the association between institutional rearing and lower general life satisfaction decreased. Further, the relationship was partly mediated by the individuals own education/socio-economic attainment in adulthood, physical health, and relationship status.

Institutional rearing is associated with lower general life satisfaction in adulthood

In many societies orphaned or abandoned children are reared in institutions which may involve early psychological neglect. Consequently, it has been reported that children reared in institutional settings are more likely than children raised in their families to have deficits in many domains such as cognitive function (e.g., O'Connor, Rutter, Beckett, Keaveney, & Kreppner, 2000), language production and comprehension (e.g., Windsor et al., 2011), and to show various forms of psychopathology (Zeanah et al., 2009), and difficulties in social functioning (e.g., Rutter et al., 1999). Higher risk of mental disorders, substance use, and personality disorders across the life span emerged after a temporary separation from parents for an average time span of 1.7 years among children evacuated from Finland to Sweden and Denmark during World War II compared to their peers who remained with their own families in Finland (Räikkönen et al., 2011).

The present paper studies possible long-term consequences of the duration of institutional rearing on general life satisfaction in adulthood. Research on the association of institutional rearing with subjective well-being and general satisfaction with life is sparse and has focused on life satisfaction during institutional care in adolescents. Sastre and Ferriere (2000) compared the life satisfaction of 50 adolescents aged between 12 to 19 years living in institutions with 50 adolescents who lived at home with their parents and found considerably lower life satisfaction in the former group. However, only little is known whether there is an enduring difference in life satisfaction that persists into adulthood.

Several theoretical accounts predict decreased levels of life-satisfaction during adulthood in individuals reared in institutions. A first explanation for the developmental problems related to exposure to institutionalization during (early) childhood involves compromised neural development due to less than optimal childcare quality in institutional settings (Sheridan, Fox, Zeanah, McLaughlin, & Nelson III., 2012). A second explanation involves programming of the neuroendocrine stress-axis activity which may permanently

increase vulnerability to stressors (Räikkönen et al., 2011). Drawing from attachment theory, a third explanation involves development of an insecure attachment representation during childhood which may make it more difficult to engage in satisfying intimate relationships during adulthood and eventually also hamper general life-satisfaction and mental health (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). Finally, children reared in institutions may lack the social and economic support from their parents during young adulthood which may lead to poor life-time socio-economic prospects.

In the present study, we first tested whether individuals reared in institutional settings differ in their general life satisfaction from people raised in their families using data from a large national representative dataset – the German Socioeconomic Panel Study (SOEP). As such critical childhood experiences may be determined by one's parental socio-economic background and education, we additionally measured and statistically control for parents' education and occupational prestige along with the participants' age and sex. Second, we tested whether such differences in life satisfaction are moderated by age as it is possible that institutional rearing is differentially associated with life satisfaction at different stages of adulthood. Moreover, with an increasing time span after having left the institution a decrease of the association of institutional rearing with life satisfaction would be possible (Luhmann, Hofmann, Eid, & Lucas, 2012). Third, we tested whether the association between institutional rearing and adulthood life satisfaction is mediated by life circumstances during adulthood including educational attainment, employment status, occupational prestige, net income, health, and relationship status. Previous research has shown that life satisfaction is related to the circumstances people are living in including educational, socio-economic, health, and relationship status (for review, see Diener, Suh, Lucas, & Smith, 1999). In turn, these life circumstances during adulthood might also be determined by critical childhood experiences such as institutional rearing.

Materials and Method

Sample

The sample comprised of 26,713 German adults of whom data from 19,210 aged from 17 to 101 years ($M = 44.79$ years, $SD = 18.74$ years; 51.5% female) were analysed in the present paper who reported their general life satisfaction and either grew up at home with both parents throughout their childhood ($n = 18,962$) or were raised in an institutional setting for at least some time ($n = 248$). Data from 7,503 participants were not analysed in the present paper as they were raised in different settings (e.g., they never spent time in an institutional setting and were raised by a single parents for at least some time). The data are from the SOEP (Version 28), which is an ongoing, nationally representative longitudinal study of private households in Germany initiated in 1984. Comprehensive information about the data collection, design, participants, variables, and assessment procedures is reported in Wagner, Frick, and Schupp (2007). All data have been collected by a professional high-quality fieldwork organization (TNS Infratest Social Research, Munich).

Materials

During the 12 years¹ of data collection the respondents reported their general life satisfaction (“All things considered, how satisfied are you with your life in general?”) at the end of each yearly interview using an 11-point scale ranging from 0 “totally dissatisfied” to 10 “totally satisfied”. Single-item measures of life satisfaction have reasonable validity as shown by moderately strong relations to measures of well-being and positive affect assessed by questionnaire, written interviews, informant reports, and measures of daily affect (Sandvik, Diener, & Seidlitz, 1993). Respondent’s general life satisfaction was estimated by calculating the mean of all data available ($M = 7.28$, $SD = 1.42$). On average the participants provided 5.84 ($SD = 3.94$; $range = 1 - 12$) data points of general life satisfaction. Participants’ age was computed as the mean of their age at the assessment time points when they reported their life satisfaction.

When entering the panel study, respondents reported where they had grown up during the first 15 years of their lives as well as their own and their parent's occupation and education. The question wording of the institutional rearing variable was "How many years of your childhood (up until age 15) did you live with the following persons? Please round off to the nearest year". For our analyses, we used data from the response options "with both your father and mother (biological or adoptive)" and "in an orphanage". The other response options as well as frequency distribution of the institutional rearing variable are provided in Online Supplement 1. Occupational prestige was scored from 13 to 78 using the Standard International Occupation Prestige Score index (SIOPS; Ganzeboom & Treiman, 1996; *respondent's*: $M = 33.70$, $SD = 17.94$; *respondent's fathers*: $M = 38.38$; $SD = 15.31$; *respondent's mothers*: $M = 26.74$, $SD = 16.29$). Occupational prestige was not available for 6,352 (33.01%) of the respondents and for 9,330 (48.57%) mothers and 2,301 (11.98%) fathers of respondents. In most cases these individuals had no occupational prestige due to being homemakers or being unemployed. In rare cases, however, the participants also did not know their parents' occupation. Missing occupational prestige was scored with the lowest value possible following the logic that being unemployed or homemaker is regarded as lower in prestige than all other paid work. Education of parents was scored from 1 to 3 (no education [1]: no school attendance, no degree obtained, other degree obtained, or respondent did not know, *respondent's fathers*: $n = 2,728$, 14.2%, *respondent's mothers*: $n = 2,895$, 15.1%; low education [2]: basic-track secondary school, *respondent's fathers*: $n = 10,674$, 55.6%, *respondent's mothers*: $n = 10,813$, 56.3%; and high education [3]: intermediate-track or academic-track secondary school, *respondent's fathers*: $n = 5,808$, 30.2%, *respondent's mothers*: $n = 5,502$, 28.6%). Education of respondents was scored using the International Standard Classification of Education (ISCED-1997; OECD, 1999). Prior to the analyses, respondents' ISCED-Scores were collapsed into three categories (low education [1]: ISCED-Scores 0, 1, and 2, $n = 3,560$, 18.5%; medium education [2]: ISCED-Scores 3 and 4, $n =$

10,347, 53.9%; and high education [3]: ISCED-Scores 5 and 6, $n = 5,303$, 27.6%). Missing information on education ($n = 56$, 0.29%) was scored as the lowest category.

Yearly data on respondent's employment status were coded (full-time employment was coded 1.0, regular part-time employment or vocational training were coded 0.5, marginal, irregular part-time employment was coded 0.25, and not employed was coded 0.0) and collapsed into a mean score to represent respondent's general employment status ($M = 0.45$, $SD = 0.41$). Missing employment status ($n = 17$, 0.09%) was replaced with the sample mean. Respondent's generalized monthly net income in Euros was estimated by calculating the mean of all yearly data available ($M = 1,021.92$ Euro, $SD = 1,298.39$ Euro). As a measure of global physical health, we calculated the mean of the reverse-coded yearly responses to the question "How would you describe your current health?" answered on a 1 (*very good*) to 5 (*bad*) scale ($M = 3.53$, $SD = 0.83$). Missing self-reported health ($n = 2$, 0.01%) was replaced with the sample mean. Imputing missing values for occupational prestige, education, employment status, and health using *stata12* and the *mi*-command leads to comparable results. Finally, respondents' relationship status was dummy coded (i.e., in a relationship was coded 1, not in a relationship was coded 0) and collapsed into a mean score to represent the respondent's general relationship status across the years they reported their life satisfaction ($M = 0.64$, $SD = 0.46$). The correlation matrix of all variables with means and standard deviations is provided as Online Supplement 2.

Analyses

To examine the association of institutional rearing with general life satisfaction, respondents were categorized into four subgroups. Three groups reared in an institution for 1 to 5 years ($n = 145$, 49.0% female), 6 to 10 years ($n = 57$, 49.1% female), and 11 to 15 years ($n = 46$, 50.0% female) were compared with respondents who lived with both parents for their first 15 years ($n = 18,962$, 51.5% female). Respondent's z-standardized general life

satisfaction served as dependent variable in hierarchical multiple regression analyses computed with SPSS 20.

Possible predictors of general life satisfaction were entered in six steps. In model 1, dummy coded variables were used to represent the subgroups institutionally reared for 1 to 5 years, 6 to 10 years, and 11 to 15 years. In model 2, respondents' age, age², age³, and sex were entered to the model 1 equation. Age was centered before age² and age³ were calculated. In model 3, respondents' parents' education (dummy coded) and occupational prestige (standardized) were included into the equation. In model 4, respondents' education (dummy coded), occupational prestige (standardized), employment status (centered), and net income (standardized) were entered. In model 5, respondents' health (centered) and, finally, in model 6 respondents' relationship status was included. A complete correlation matrix of all variables is provided in Online Supplement 2. In addition, respondent age when taking the questionnaire was tested as a moderator of the association between the experience of institutional rearing and life satisfaction during adulthood following the procedure proposed by Aiken and West (1991) and controlling for respondents' sex.

Results

Descriptive analyses revealed that respondents reared in institutions were older ($t = 4.75, p < .001, d = 0.30$) and had lower education (i.e., a higher probability to have low education; $\chi^2(1) = 35.15, p < .001$; or medium education; $\chi^2(1) = 4.52, p < .05$; and a lower probability to have high education; $\chi^2(1) = 7.74, p < .01$), occupational prestige ($t = 7.07, p < .001, d = 0.45$), general employment status ($t = 5.27, p < .001, d = 0.34$), net income ($t = 2.80, p < .01, d = 0.18$), and health status ($t = 7.32, p < .001, d = 0.47$) than respondents who lived with both parents for their first 15 years. However, with regard to sex and relationship status there were no significant differences between the two groups ($\chi^2(1) = .53, p = .469; t = 0.55, p = .586, d = .01$).

The results of the hierarchical multiple regression analyses are depicted in Table 1. Model 1 showed a significant association of institutional rearing with general life satisfaction. Compared to people raised in families, individuals reared in institutions reported significantly lower general life satisfaction in the manner of a dose response relationship. The effect size for the difference in life satisfaction between the group reared 11-15 years in institutions ($n = 46$) and the group reared by both parents ($n = 18,962$) in Model 1 was in the moderate to large range ($d = 0.74$; statistical power: 0.9995 as revealed by post-hoc power analysis using G*Power 3, <http://www.psych.uni-duesseldorf.de/abteilungen/aap/gpower3/>). The effect sizes for the groups reared 6-10 years in institutions ($n = 57$) and reared 1-5 years in institutions ($n = 145$) in Model 1 were in the moderate range ($d = 0.48$; statistical power: 0.98) and in the small range ($d = 0.22$; statistical power: 0.84), respectively.

The results of model 2 showed an association of respondents' age and sex with their general life satisfaction, however, the association of institutional rearing with life satisfaction was not reduced by inclusion of respondents' age or sex. Model 3 revealed that inclusion of educational attainment and occupational prestige of respondents' parents to the model attenuated the association of institutional rearing with the respondent's general life satisfaction by 34%. The inclusion of respondents' education, occupational prestige, employment status, and net income into the model (Model 4) attenuated the association of institutional rearing with life satisfaction by further 18%. In addition, the difference in general life satisfaction between respondents reared in institutions for 1 to 5 years and respondents who lived with both parents for their first 15 years was no longer significant. After the inclusion of respondents' perception of their physical health (Model 5), the association of institutional rearing with life satisfaction was further attenuated by 29%. Furthermore, only the difference in general life satisfaction between respondents reared in institutions for 10 to 15 years and respondents who lived with both parents for their first 15 years remained significant. Finally, the inclusion of respondents' general relationship status (Model 6)

attenuated the association of institutional rearing with life satisfaction further by 4%. As in the previous model, only the difference in general life satisfaction between respondents reared in institutions for 10 to 15 years and respondents who lived with both parents for their first 15 years remained significant.²

In addition, respondents' age in adulthood when reporting their life satisfaction moderated the association between the duration of institutional rearing and life satisfaction for respondents raised for 1-5 years and 6-10 years in institutions but not for respondents who lived in institutions for 11-15 years (*1-5 years* × *age*: $B = .19, t = 4.70, p < .001$; *6-10 years* × *age*: $B = .20, t = 2.30, p < .05$; *10-15 years* × *age*: $B = .13, t = 1.40, p = .162$) controlling respondents' sex. The moderation was such that the negative association of institutional rearing with life satisfaction decreased with increasing age (see Figure 1).

Discussion

Our analyses showed a significant negative association of institutional rearing with general life satisfaction in the manner of a dose response relationship – the longer the duration of institutional rearing the lower the general life satisfaction during adulthood.

For the subgroup reared in institutions for 10 to 15 years, this association held even after controlling for respondents' age and sex, the education and occupational prestige of their parents, respondents' own education, occupational prestige, employment status and net income, as well as their health and relationship status although the association was considerably attenuated. The findings are consistent with the notion that the negative association between institutional rearing and life satisfaction is at least partly mediated by factors such as attained educational level, occupation status, physical health, and relationship status during adulthood. Institutional rearing is a risk factor for poor academic education and occupational trajectory as individuals reared in institutions may also lack relevant resources during young adulthood to thrive in the educational system and working environment, which in turn may explain negative adulthood outcomes (Pesonen et al., 2013). Moreover,

institutional rearing is a risk factor for a less than optimal development of the attachment representation as individuals reared in institutions may also lack the relevant positive experiences with the primary caregiver (Zeanah et al., 2009). As attachment experiences with the primary caregiver plays an important role for the attachment representation in adulthood (Waters et al., 2000), one possible pathway by which institutional rearing might affect later satisfaction with life is through compromised adult attachment representation and, relatedly, through poor relationship success. In this respect, it is however important to bear in mind that in the present study no measures of the child care quality in the institutions nor measures of adult attachment representation were assessed. Thus, the interpretation that adult attachment representation would act as a mediator of the association of institutional rearing with adult life satisfaction in the present study is not possible. In addition, as the individuals' institutional rearing experiences were not assessed explicitly in the present study it is not possible to disentangle which aspects of these childhood experiences might be most important for later life satisfaction. Taken together, the findings are consistent with the notion that institutionally reared individuals, who live in a relationship, who attained comparable educational, socio-economic, and physical health status as participants who grew up in their families, may catch up in their life satisfaction during adulthood.

The group reared in institutions for more than 10 years, however, still showed lower levels of life satisfaction after controlling all these possible mediators. One possible interpretation of this finding is that the experience of institutional rearing across the whole childhood might relate to adulthood life satisfaction through further pathways as for instance neurobiological or endocrine alterations (Räikkönen et al., 2011; Sheridan et al., 2012,) which need not necessarily be mediated by adulthood life circumstances.

The unfavorable association of institutional rearing with life satisfaction was moderated by the individuals' age. The older the individuals were (or in other terms: the more time has passed since the experience of institutional rearing) the smaller was the association.

This finding is consistent with the notion that the longer ago a negative experience the smaller the imposed impact (Luhmann et al., 2012). Alternatively, it is also possible that during middle and older adulthood life circumstances provide more psycho-social hold which may be favorably related to life satisfaction.

The pattern of our results is consistent with the idea that there is a link between the number of years an individual was reared in an institutional setting and adulthood life satisfaction. However and importantly, also other interpretations of the findings are possible. The probability to be raised in an institutional setting is not at random and may also be associated with child characteristics such as difficult temperament and behavioral problems. Such child characteristics may in turn relate to adverse adulthood outcomes involving poor life satisfaction. Moreover, assuming a causal link between institutional rearing and life satisfaction during adulthood which is mediated by educational and economic attainment, physical health, and relationship status, it would still remain unclear through which process these mediators might be affected and through which process they would exert an influence on life satisfaction themselves. Further limitations to the study include that the number of years spent in an institutional setting was assessed retrospectively and that no information is available regarding the time point of institutional care during childhood for participants who did not spend the whole childhood in institutional care.

In conclusion, our data show that growing up in an institutional setting, in particular if throughout the childhood, is associated with lower life satisfaction during adulthood. This association appears to be more pronounced during younger than during older age, and the association is smaller when adulthood life circumstances are more favorable involving better occupational and educational attainment, better physical health, and presence of a partner relationship.

References

- Aiken, S. A., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*, 276-302. doi: 10.1037//0033-2909.125.2.276
- Ganzeboom, H. B. G., & Treiman, D. J. (1996). Internationally comparable measures of occupational status for the 1988 International Standard Classification of Occupations. *Social Science Research*, *25*, 201-239. doi: 10.1006/ssre.1996.0010
- Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: A meta-analysis. *Journal of Personality and Social Psychology*, *102*, 592-615. doi: 10.1037/a0025948
- O'Connor, T. G., Rutter, M., Beckett, C., Keaveney, L., & Kreppner, J. M. (2000). The effects of global severe privation on cognitive competence: Extension and longitudinal follow-up. *Child Development*, *71*, 376-390. doi: 10.1111/1467-8624.00151
- OECD. (1999). *Classifying Educational Programmes: Manual for ISCED-97 Implementation in OECD Countries*. Paris: OECD.
- Pesonen, A.-K., Räikkönen, K., Kajantie, E., Heinonen, K., Osmond, C., Barker, D. J. P., Forsén, T., & Eriksson, J. G. (2011). Inter-generational social mobility following early life stress. *Annals of Medicine*, *43*, 320-328. doi: 10.3109/07853890.2010.549146
- Räikkönen, K., Lahti, M., Heinonen, K., Pesonen, A.-K., Wahlbeck, K., Kajantie, E., . . . Eriksson, J. G. (2011). Risk of severe mental disorders in adults separated temporarily from their parents in childhood: The Helsinki birth cohort study. *Journal of Psychiatric Research*, *45*, 332-338. doi: 10.1016/j.jpsychires.2010.07.003
- Rutter, M., Andersen-Wood, L., Beckett, C., Bredenkamp, D., Castle, J., Groothues, C., . . . O'Connor, T. G. (1999). Quasi-autistic patterns following severe early global privation.

- English and Romanian Adoptees (ERA) Study Team. *Journal of Child Psychology and Psychiatry*, *40*, 537-549. doi: 10.1111/1469-7610.00472
- Sandvik, E., Diener, E., & Seidlitz, L. (1993). Subjective well-being: The convergence and stability of self-report and non-self-report measures. *Journal of Personality*, *61*, 317-342. doi: 10.1111/j.1467-6494.1993.tb00283.x
- Sastre, M. T. M., & Ferriere, G. (2000). Family "decline" and the subjective well-being of adolescents. *Social Indicators Research*, *49*, 69-82. doi: 10.1023/A:1006935129243
- Sheridan, M. A., Fox, N. A., Zeanah, C. H., McLaughlin, K. A., & Nelson III., C. A. (2012). Variation in neural development as a result of exposure to institutionalization early in childhood. *Proceedings of the National Academy of Sciences USA (PNAS)*, *109*, 12927-12932. doi: 10.1073/pnas.1200041109
- Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP) - Scope, evolution and enhancements. *Schmollers Jahrbuch*, *127*, 161-191. doi: 10.2139/ssrn.1028709
- Waters, E., Merrick, S., Treboux, D., Crowell, J., & Albersheim, L. (2000). Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Development*, *71*, 684-689. doi: 10.1111/1467-8624.00176
- Windsor, J., Benigno, J. P., Wing, C. A., Carroll, P. J., Koga, S. F., Nelson, C. A. r., . . . Zeanah, C. H. (2011). Effect of foster care on young children's language learning. *Child Development*, *82*, 1040-1046. doi: 10.1111/j.1467-8624.2011.01604.x
- Zeanah, C. H., Egger, H. L., Smyke, A. T., Nelson, C. A. r., Fox, N. A., Marshall, P. J., & Guthrie, D. (2009). Institutional rearing and psychiatric disorders in Romanian preschool children. *The American Journal of Psychiatry*, *166*, 777-785. doi: 10.1176/appi.ajp.2009.08091438

Footnotes

¹ Data on respondents' life satisfaction was available for 28 years as life satisfaction was measured since the very beginning of the SOEP study in 1984. However, the information where respondents had grown up in the first 15 years of their life was only available for respondents who entered the panel after the year 2000.

² Accounting for the number of data points used to compute the life satisfaction composite did not change the main results of the study. Estimating the models using a continuous institutional rearing variable leads to comparable results: the effect of institutional rearing was negative and significant (*model 1*: $B = -.06$, $t = 7.14$, $p < .001$; *model 6*: $B = -.02$, $t = 2.76$, $p < .01$). For each year a person was reared in an institutional setting, the reported general life satisfaction was .06 (model 1) to .02 (model 6) standard deviations lower.

Further, we reanalyzed the data for the group reared 11-15 years in institutions ($n = 46$) and the group reared by both parents ($n = 18,962$) applying propensity score matching. We used *stata 12* with the software package *psmatch2* with default options and, first, estimated a propensity score for each individual, defined as the conditional probability (from a probit model) of being reared in an institution for 11-15 years given the full set of variables for respondent's age, sex, respondent's parents' education and occupational prestige, respondent's education, occupational prestige, employment status, net income, health, and relationship status (i.e., all covariates of the regression model 6). The propensity score was then used to create a matched control group reared by both parents. After this matching procedure, the treatment and control group had similar measured characteristics regarding the covariates and the effect of being reared 11-15 years in institutions was estimated by comparing the means of general life satisfaction between the matched groups. The results were comparable to our full model (Model 6): *average life satisfaction of group reared 11-15 years in institutions: $M = -0.74$; average life satisfaction of the unmatched control group: $M =$*

0.01; average life satisfaction of matched control group: $M = -0.36$; difference between group reared 11-15 years in institutions and matched control group = 0.38, $t(90) = 1.68$, $p < .05$).

Table 1. *Unstandardized Regression Coefficients (B) and Intercept for Variables as Predictor of General Life Satisfaction.*

Dependent Variable: General Life Satisfaction	zero-order effects	Model					
		1	2	3	4	5	6
Intercept	-	.01	-.03*	-.04*	-.12***	-.05***	-.14***
Years reared in a children's home							
1-5 years	-.22**	-.22**	-.22**	-.16*	-.11	-.02	-.01
6-10 years	-.48***	-.48***	-.47***	-.41**	-.36**	-.18	-.15
11-15 years	-.73***	-.74***	-.72***	-.56***	-.47***	-.31*	-.25*
Age	-.03***		.03***	.03***	.06***	.18***	.16***
Age ²	.00		.02***	.02***	.07***	.05***	.07***
Age ³	-.00***		-.01***	-.01***	-.02***	-.01***	-.02***
Sex (0 = female, 1 = male)	-.03*		-.04**	-.04**	-.16***	-.16***	-.17***
Father's education (ref.: low)							
Unknown	-.19***			-.05	-.05	-.05	-.04
High	.19***			.05*	.00	-.01	-.01
Father's occupational prestige	.10***			.08***	.06***	.04***	.04***
Mother's education (ref.: low)							
Unknown	-.18***			-.07*	-.05	-.03	-.03
High	.18***			.05*	.01	.01	.01
Mother's occupational prestige	.04***			-.02**	-.02*	-.08*	-.02*
Education (ref.: medium)							
Low	-.13***				-.13***	-.08***	-.07***
High	.25***				.15***	.07***	.06***
Occupational prestige	.12***				.03**	.00	.01
Employment status	.19***				.15***	.06*	.07**
Net income	.13***				.11***	.08***	.08***
Health	.58***					.68***	.68***
Relationship status	.17***						.35***
Observations	19,210	19,210	19,210	19,210	19,210	19,210	19,210
Adjusted R ²	-	.002***	.009***	.021***	.055***	.292***	.308***

Note.

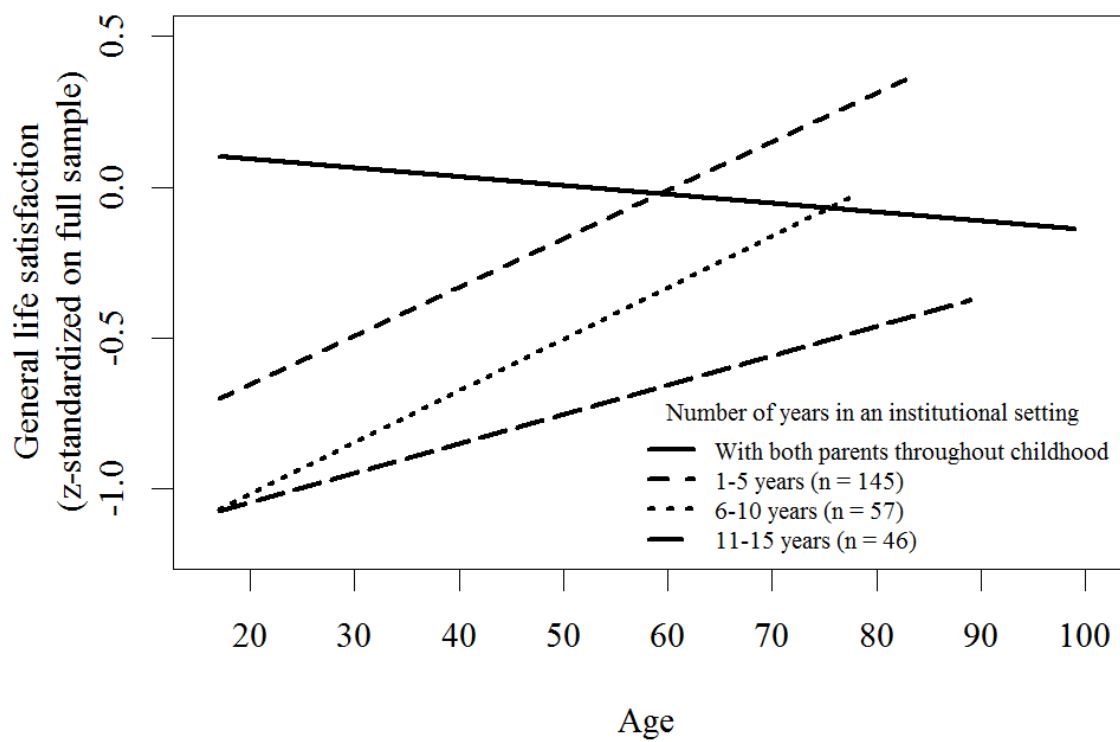
We report unstandardized coefficients. The dependent variable was standardized before analysis.

Values for age are given in 10-year units. Age was centered before higher order terms were calculated.

Education of respondents and respondent's parents were dummy coded. Occupational prestige and net income were standardized; health, employment status and partnership status were centered.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 1. Age moderates the association of institutional rearing with general life satisfaction.



Online supplement 1. *Question wording, response options as well as frequency distribution of the question where respondents had grown up during the first 15 years of their lives.*

Question Wording

How many years of your childhood (up until age 15) did you live with the following persons?

Please round off to the nearest year.

Response Options

With both your father and mother (biological or adoptive) _____

With your mother without a new husband or partner _____

With your mother and her new husband or partner _____

With your father without a new wife or partner _____

With your father and his new wife or partner _____

With other relatives _____

With foster parents _____

In an orphanage _____

Please check your answers by adding up the years: 15 years

Frequency Distribution

Years	Response option							
	1	2	3	4	5	6	7	8
0	1,713	22,965	25,169	26,076	26,147	25,838	26,036	26,428
1	187	272	70	78	40	68	27	49
2	255	319	87	66	33	66	30	43
3	303	276	95	56	32	51	22	29
4	234	202	82	35	19	39	16	19
5	308	283	123	31	39	41	20	21
6	277	195	92	26	15	43	7	16
7	244	187	101	16	23	37	16	12
8	254	178	98	15	21	31	11	13
9	224	166	83	9	26	24	7	17
10	363	195	110	16	13	29	5	9
11	220	124	56	10	15	14	6	3
12	284	127	93	11	20	26	9	4
13	255	110	55	7	9	28	8	8
14	262	81	31	1	9	14	5	5
15	21,319	837	163	25	19	132	29	30
Total	26,702	26,517	26,508	26,478	26,480	26,481	26,254	26,706

Note.

Response options: 1 with both your father and mother (biological or adoptive), 2 with your mother without a new husband or partner, 3 with your mother and her new husband or partner, 4 with your father without a new wife or partner, 5 with your father and his new wife or partner, 6 with other relatives, 7 with foster parents, 8 in an orphanage.

Online supplement 2. Means (*M*), standard deviations (*SD*), and intercorrelations of dependent and independent variables.

	M	SD	1	2	3	4
(1) General life satisfaction	7.28	1.42	-	-.02**	-.03***	-.04***
Years reared in a children's home						
(2) 1-5 years	0.01	0.09		-	-.01	-.01
(3) 6-10 years	0.00	0.05			-	.00
(4) 11-15 years	0.00	0.05				-
(5) Age	44.79	18.74				
(6) Sex (0 = female, 1 = male)	0.49	0.50				
Father's education						
(7) Unknown	0.14	0.35				
(8) Low	0.56	0.50				
(9) High	0.30	0.46				
(10) Father's occupational prestige	38.38	15.31				
Mother's education						
(11) Unknown	0.15	0.36				
(12) Low	0.56	0.50				
(13) High	0.29	0.45				
(14) Mother's occupational prestige	26.74	16.29				
Education						
(15) Low	0.19	0.39				
(16) Medium	0.54	0.50				
(17) High	0.28	0.45				
(18) Occupational prestige	33.70	17.94				
(19) Employment status	0.45	0.41				
(20) Net income	1021.92	1298.39				
(21) Health	3.53	0.83				
(22) Relationship status	0.64	0.46				

	5	6	7	8	9	10
(1) General life satisfaction	-.05***	-.02*	-.07***	-.04***	.09***	.10***
Years reared in a children's home						
(2) 1-5 years	.02*	.00	.02***	-.01	-.01	-.05***
(3) 6-10 years	.02***	.00	.03***	-.01	-.01	-.03***
(4) 11-15 years	.02***	.00	.06***	-.02**	-.03***	-.06***
(5) Age	-	-.01*	-.10***	.33***	-.28***	-.04***
(6) Sex (0 = female, 1 = male)		-	.00	-.01	.01	.01
Father's education						
(7) Unknown			-	-.46***	-.27***	-.27***
(8) Low				-	-.74***	-.20***
(9) High					-	.43***
(10) Father's occupational prestige						-
Mother's education						
(11) Unknown						
(12) Low						
(13) High						
(14) Mother's occupational prestige						
Education						
(15) Low						
(16) Medium						
(17) High						
(18) Occupational prestige						
(19) Employment status						
(20) Net income						
(21) Health						
(22) Relationship status						

	11	12	13	14	15	16
(1) General life satisfaction	-.07***	-.03***	.08***	.04***	-.05***	-.06***
Years reared in a children's home						
(2) 1 -5 years	.01	.01	-.01	-.01	.03***	-.01
(3) 6-10 years	.02*	.00	-.01	-.01	.02**	-.01
(4) 11-15 years	.06***	-.02**	-.02***	-.03***	.02***	.00
(5) Age	-.08***	.38***	-.36***	-.33***	-.16***	.02**
(6) Sex (0 = female, 1 = male)	-.01	-.01	.02*	-.01	-.07***	-.06***
Father's education						
(7) Unknown	.72***	-.36***	-.18***	-.12***	.12***	-.01
(8) Low	-.32***	.64***	-.45***	-.21***	-.05***	.13***
(9) High	-.20***	-.43***	.62***	.32***	-.04***	-.14***
(10) Father's occupational prestige	-.25***	-.12***	.32***	.34***	-.11***	-.12***
Mother's education						
(11) Unknown	-	-.48***	-.27***	-.16***	.12***	-.01
(12) Low		-	-.72***	-.24***	-.08***	.12***
(13) High			-	.38***	.00	-.12***
(14) Mother's occupational prestige				-	.02**	-.05***
Education						
(15) Low					-	-.52***
(16) Medium						-
(17) High						
(18) Occupational prestige						
(19) Employment status						
(20) Net income						
(21) Health						
(22) Relationship status						

	17	18	19	20	21	22
(1) General life satisfaction	.11***	.12***	.08***	.13***	.48***	.08***
Years reared in a children's home						
(2) 1-5 years	-.01	-.04***	-.03***	-.02**	-.03***	.00
(3) 6-10 years	.00	-.02**	-.02*	.00	-.03***	.01
(4) 11-15 years	-.02**	-.03***	-.02**	-.02*	-.03***	-.01
(5) Age	.12***	-.23***	-.22***	-.03***	-.48***	.36***
(6) Sex (0 = female, 1 = male)	.12***	.10***	.25***	.28***	.05***	.03***
Father's education						
(7) Unknown	-.09***	-.06***	-.02**	-.06***	.01	-.04***
(8) Low	-.11***	-.10***	-.01	-.04***	-.18***	.17***
(9) High	.18***	.16***	.03***	.08***	.19***	-.15***
(10) Father's occupational prestige	.23***	.15***	.03***	.12***	.09***	.00
Mother's education						
(11) Unknown	-.09***	-.07***	-.02**	-.05***	-.01	-.03***
(12) Low	-.06***	-.08***	.00	.00	-.19***	.21***
(13) High	.13***	.15***	.02*	.04***	.22***	-.20***
(14) Mother's occupational prestige	.04***	.08***	.02*	-.01	.18***	-.18***
Education						
(15) Low	-.30***	-.27***	-.25***	-.23***	.01	-.27***
(16) Medium	-.67***	-.16***	-.01	-.17***	-.07***	.05***
(17) High	-	.41***	.23***	.39***	.07***	.18***
(18) Occupational prestige		-	.68***	.64***	.24***	.14***
(19) Employment status			-	.67***	.20***	.21***
(20) Net income				-	.14***	.23***
(21) Health					-	-.14***
(22) Relationship status						-

Note.

* $p < .05$. ** $p < .01$. *** $p < .001$.