

Response to Invited Commentary

Pesonen et al. Respond to “The Life Course Epidemiology of Depression”

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In his insightful commentary on our recent publication (1), Gilman (2) mentions three potential challenges with implications for life-course research.

First, confounders related to unobserved factors are of major importance in all scientific research. Exceptional conditions, such as in Finland during World War II, are comparable to major environmental disasters. They are particularly significant to natural experimental designs because potential confounders are assumed to be randomly distributed across the groups under investigation. The likelihood of a Finnish child being evacuated was influenced by an unpredictable interplay between political and intrafamilial factors, such as the parents generally choosing to send only one or some children away (3). Despite Gilman's view (2), the evacuations were voluntary, not under “mandatory evacuation orders.” In 1942, when the first massive wave of evacuations took place, the war was also expected to end quickly. In response to Gilman's concern, we did not find that parental socioeconomic status influenced the route of evacuation, either through the governmental system or other contacts ($p > 0.27$).

Even child mental health professionals advocated the evacuations (4, 5), creating the sense that this was an opportunity for children, as Finnish child psychiatrist T. Brander pertinently remarked in 1943:

Not a single case has come to my attention in which a child suffered psychological injury from this voluntary evacuation. Quite the contrary: such a stay proved to be an instructive and refreshing experience, from which the children returned with heightened vitality. This was due to the excellent care and attention bestowed on our children by our western neighbours (4, p. 314).

As to the second challenge of sampling bias, approximately 11 percent of the children were adopted in Sweden

(3). A previous study (6) found no significant differences in mental health status between the adopted and returned former child evacuees. In addition to adoptions, the migration processes between Sweden and Finland have been relatively complex, some adopted children moving back to Finland as they grew up, and some former evacuees moving back to Sweden as young adults. The mortality of evacuated children was 0.6 percent over the whole evacuation period (mean: 2.1 years), slightly lower than the annual mortality among Finnish children aged 1–9 years, which ranged from 0.4 percent to 0.5 percent during 1941–1945 (7). We acknowledge that the parents may have generally chosen the weakest child(ren), causing potential bias (8). However, the original governmental policy aimed at excluding unhealthy children. Later in the war, sick children (11 percent of registered evacuations, 3.5 percent mortality) were also considered eligible for evacuation (3). (Note: The statistics on adoption and mortality during evacuation are based on the register in the Finnish National Archives (48,628 evacuated children).)

Third, Gilman (2) claims that model specification is a challenge to causal inference. As many studies report, our study found higher educational attainment to be associated with fewer depressive symptoms (age-adjusted $r = -0.11$, $p = 0.001$). The effect of education on depressive symptoms remained even when it was entered into a regression equation simultaneously with the evacuation variable but, unlike Räsänen (9) in a previous study, we found no statistical evidence of an association between evacuation and adult educational attainment ($p = 0.81$) nor did educational attainment mediate between evacuation and depressive symptoms.

Finally, we agree with Gilman that the evacuated children may have experienced other adversities during their foreign stay, making it difficult to isolate the effect of separation from

other influences. However, the children lost their secure base with the unpredictable evacuation (10) and, thus, the parental assistance needed in regulating emotions, especially under serious stress. As a subjective case report brought up by Gilman describes (11), the separation trauma evoked both dissociative memory function and uncontrollable anxiety, which characterized individual emotion regulation even 50 years after evacuation. Importantly, the former child evacuees in the Kuopio study ($n = 379$) (6) reported more distress symptoms, fears, and obsessive thoughts than did their controls ($n = 144$), although there were no differences in clinical mental health status among subgroups of 30 individuals.

To conclude, we must carefully reflect upon the quality of the nature in natural experiments. Until now, we have found no systematic trends in the selection of the children, but we acknowledge that exploration of these trends, also beyond the existing data, is crucial.

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