

Vulnerability and resilience after early institutional care: The Greek Metera study

PANAYIOTA VORRIA,^a MARIA NTOUMA,^a AND MICHAEL RUTTER^b

^a*Aristotle University of Thessaloniki; and* ^b*King's College London*

Abstract

The aim of the study was to examine possible influences on individual differences in adolescence in response to early institutional care in infancy not involving either generalized privation or subnutrition. Fifty-two adopted adolescents aged 13 years who received institutional care in infancy at the Metera Babies Centre and 36 adolescents of the same age who were raised in their biological families participated in the study. Adolescents' attachment relationships, cognition, behavioral adjustment and use of psychological services were assessed. Marked heterogeneity in outcomes was found. No predictive effects were found for preinstitutional features or for adoptive circumstances. By contrast a large effect was found for institutional care extending beyond the age of 2 years and for quality of institutional care as experienced at an individual level. There was a close association between prolonged institutional care and disorganized attachment while in the institution, but the main institutional effect derived from the length of time in the institution.

As long ago as 1972, Rutter emphasized the importance and pervasiveness of individual differences in children's responses to stress and adversity. More recently, Rutter (2006) noted that such differences applied to physical hazards, such as malnutrition, infections and irradiation, just as much as to adverse psychosocial experiences. Moreover, the phenomenon has been studied experimentally as well as naturalistically. For example, Cohen and Williamson (1991) inoculated volunteers with a cold virus, finding substantial individual variation in response, with psychosocial stress preceding inoculation associated with an increased rate of infection. In addition, as the Singer and Ryff committee (National Research Council, 2001) pointed out, even with identified Mendelian genes for specific cancers, there is marked heterogeneity in disease outcomes. It might be expected that individual differences would be less with respect to psychosocial adversity if the psychological deprivation was exceptionally severe and prolonged; however, the evidence from the English and Romanian Adoptee (ERA) study showed that this

was not the case (Rutter, Kreppner, O'Connor, & ERA Study Team, 2001). It is perhaps surprising that there was no reduction in heterogeneity with more prolonged institutional care involving pervasive privation.

As Cicchetti (2010) pointed out, over the last several decades the research focus has shifted from identifying protective factors to a search for the mechanisms underlying resilience. It is in that tradition that our Greek Metera Babies Centre study was designed. Our thinking, and therefore our planning of the study, has been based on a recognition of the importance of six key concepts. First, we appreciate that resilience is not an individual trait; rather, it reflects a dynamic developmental process (Luthar, Cicchetti, & Becker, 2000; Masten, 2014). Second, we accept the need to examine multiple possible mechanisms. These may reflect multifinality (any single feature may have multiple outcomes) and equifinality leading to resilience (meaning that a number of separate routes may lead to the same outcome; see Cicchetti & Rogosch, 1996). Third, it is crucial to consider the possibility that children may either increase or decrease in vulnerability as they grow older because of both sensitive period effects and also cascade effects by which what happens at one age may shape what happens later (Masten & Cicchetti, 2010). Fourth, in our seeking to identify the possible mechanisms underlying individual differences in vulnerability and resilience, two key methodological issues concern assessment of whether the differences in outcome reflect either differences in risk exposure or an inadequate coverage of possible ways in which outcome is affected (see Masten, 2014; Rutter, 2012, 2013). Fifth, multiple-informant, multiple-measure assessment will be required and, despite the diversity of features to be considered, it will often be useful to construct more

We are extremely grateful to the young people and their parents for giving their time so generously in all three stages of the study. We are also deeply appreciative of the help throughout of the staff members of the Metera Babies Centre who made all of the work possible. We thank Professor Grigoris Kioseoglou at the Aristotle University at Thessaloniki for statistical advice; part of this research, concerning the CAI codings, was cofinanced by the European Union (European Social Fund) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework, Research Funding Program: Heracleitus II. We express our sincere thanks to the Nuffield Foundation for the financial support of the travel involved in the follow-up.

Address correspondence and reprint requests to: Panayiota Vorria, Department of Psychology, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece; E-mail: vorria@psy.auth.gr.

global indices (Cicchetti, Rogosch, Lynch, & Holt, 1993; Vailant, 2013). This also implies that effects on positive or negative functioning and on different individual outcome measures may need to be differentiated in case they are not the same. Sixth, in examining features associated with individual differences in outcome, developmental considerations mean that those features should span the periods in Metera and post adoption (Cicchetti et al., 1993, Cicchetti & Toth, 2009).

The starting point for our study was a focus on the later consequences of early rearing in the Metera Babies Centre, which constituted rearing in a setting that lacked individualized personal care but which otherwise did not involve either pervasive privation or subnutrition (Vorria, Ntouma, Vairami, & Rutter, 2015; Vorria et al., 2003). Each caregiver was allocated an individual child about the age of 6 months for whom they had special responsibility and who was expected to treat them as “mother.” Staff turnover was low, but shifts meant that the effective number of children per caregiver at any one time was usually about four to six. Detailed measures using the reliable Parent/Caregiver Involvement Scale (PCIS; Farran, Kasari, Comfort, & Jay, 1986) provided an individualized assessment of each child’s actual institutional experience on overall amount, appropriateness, and quality of interaction, as well as caregiver sensitivity.

Most reviews of the effects of institutional care (Julian, 2013; van IJzendoorn et al., 2011) have not subdivided institutions according to the presence or absence of general pervasive deprivation and/or subnutrition as well as a serious lack of personalized caregiving. This is particularly unfortunate because it has been known for a long time (Tizard, Sinclair, & Clarke, 1975) that group-living institutions vary in the extent to which childcare is child oriented or task oriented and that this matters with respect to the children (St. Petersburg–USA Orphanage Research Team, 2008). It cannot be expected that all forms of institutional care will have the same effects. Nevertheless, it is important that this broader literature be used to derive leads on what might be relevant. The evidence from the Romanian study (Kumsta, Rutter, Stevens, & Sonuga-Barke, 2010; Nelson, Fox, & Zeanah, 2014) indicates that Gene \times Environment interactions could well be influential. The Greek study does not include DNA data, meaning that we cannot examine the matter; however, it is a reminder that individual differences in institutional care experiences are likely to reflect child characteristics as well as institutional features. The Romanian study (Nelson et al., 2014), as well as Julian’s (2013) broader review, also indicated that there was often a stepwise increase in ill effects (although studies varied somewhat as to whether this occurred as early as 6 months or as late as 2 years). Beyond that step, neither the overall duration of institutional care (at least up to 3.5 years) nor the duration of adoptive (or foster) care made a major difference. The implication is that there is some form of sensitive period, but the evidence suggests that its timing may vary somewhat according to the developmental function being considered. Possible sleeper effects (meaning later emerging consequences of earlier experiences) might

also be operating, although the evidence so far is inconclusive. The St. Petersburg study (McCall, 2013) also showed that institutional care varied in quality, that it could be altered, and that the children benefitted from appropriate institutional changes. It was crucial that the quality of care in Metera be assessed in terms of individual differences in the quality of care experienced. Finally, the Romanian study by Nelson et al. (2014) suggested that boys were less responsive to beneficial interventions than were girls, although the ERA study (Rutter et al., 2010) did not find a sex difference. All studies have shown great heterogeneity in outcomes, and the determination of the influences making resilience more or less likely constitutes a key challenge.

Aims

1. To determine the extent of individual differences in outcomes at age 13 years for adopted individuals who experienced an early institutional rearing when multiple different indices of outcome were combined.
2. To determine whether individual differences in outcomes were best accounted for by circumstances prior to admission to Metera, by institutional experiences, or by experiences postadoption.

Method

Participants

There were 86 infants living in the Metera Babies Centre who provided the starting point. Nineteen of these were not adopted (14 because they were returned to their biological parents, 3 because they were fostered, and 2 because they were still in Metera) at the time of the first follow-up at age 4 years (Vorria et al., 2006). Six adopted children declined to participate in the follow-up, meaning that the operative sample was 61. Seven of these 61 declined to participate in our second follow-up 9 years later, and 2 could not be traced; this makes an effective sample of 52 (with an 85% participation rate from the first follow-up study to the second follow-up study).

The comparison group comprised 41 infants attending a day nursery who were living with both biological parents. Five declined participation (2 in the first follow-up and 3 in the second), so there was an effective sample of 36 adolescents with a participation rate of 92% from the first follow-up study to the second follow-up study.

The two groups were closely compatible in age at follow-up (mean = 13.1 years, $SD = 0.5$ years in the adoptive group, and mean = 13 years, $SD = 0.5$ years for the comparison group). In both groups there was an approximately equal sex ratio.

Adoption took place at a mean age of 1 year, 8 months ($SD = 0.7$, range = 11 months to 3 years, 5 months), and by the time of follow-up they had been with their adoptive family for a mean duration of 11 years, 2 months ($SD = 0.83$, range = 9 years, 4 months to 12 years, 5 months).

Measure of quality of institutional care

This was assessed by using the main scales of the PCIS. Relatively good experiences were coded if the individual scored in the better half of the PCIS on three or four out of four scales. Relatively poor experiences were coded if the scores were in the worse half on at least three out of the four scales.

*Measures in adolescence**Adolescents' measures.*

Attachment. Attachment in adolescence was assessed using the Child Attachment Interview (CAI; Target, Fonagy, & Shmueli-Goetz, 2003). The CAI is a 19-question, semi-structured interview that assesses the child's mental representations of attachment figures. Each adolescent's interview was videotaped and then transcribed. The CAI is coded using eight different scales: emotional openness, balance of positive/negative references to attachment figures, use of examples, preoccupied anger, idealization, dismissing/avoidance, resolution of conflicts, and overall coherence. Each dimension is rated on a 9-point scale from 1 for a low score to 9 for a high score. Scores in the eight scales guide us to classify each child in one of the four main attachment classifications: secure, dismissing, preoccupied, and disorganized.

The CAI was administered and rated by M.N., who had been trained on scoring by Yael Shmueli-Goetz at the Anna Freud Centre. A second rater, Maria Vairami, who had also been trained by Shmueli-Goetz, independently coded 20 (23%) of the cases randomly. The agreement between the coders on security/insecurity was $\kappa = 0.89$. Intraclass correlations were also conducted in order to check the agreement between the two coders on the CAI scales. Intraclass correlation coefficients were found satisfactory in all of the CAI scales, ranging from 0.72 to 0.95.

Cognitive development. Adolescents' cognitive development was assessed using a Greek short version of Wechsler Intelligence Scale for Children (Greek WISC-III; Georgas, Paraskevopoulos, Bezevegis, & Giannitsas, 1997) including four subscales of the WISC-III: two nonverbal/practical scales (block design and picture completion) and two verbal scales (vocabulary and similarities). WISC-III is the last version of WISC that has been standardized in Greek populations. These four subscales were selected to provide a good estimate of full-scale IQ (reliability coefficient = 0.94; Sattler, 1992). The Cronbach coefficient α values were 0.66 for picture completion, 0.89 for block design, 0.80 for information, 0.84 for vocabulary, and 0.90 for the total IQ score.

Behavioral problems. The Strengths and Difficulties Questionnaire for Children (SDQ) was used in order to assess behavioral problems (Goodman, 1994). The SDQ consists of 25 items that are divided into five subscales of five items each: emotional symptoms, conduct problems, hyperactivity, problems with peers, and prosocial subscale. The Greek ver-

sion of the questionnaire was used (Bibou-Nakou, Kiosseoglou, & Stogiannidou, 2002). The questionnaire was completed by the adolescents themselves, their mothers, and their teachers. The Cronbach α values for the total scores were 0.59 for the adolescent SDQ, 0.76 for the mother SDQ, and 0.78 for the teacher SDQ.

*Qualities of adoptive home**Maternal questionnaires.*

Maternal stress. Mothers were asked to complete the Stress Index for Parents of Adolescents (Sheras, Abidin, & Konold, 1998) that assesses the relationships of the parenting stress to adolescent characteristics, parent characteristics, the quality of the adolescent-parent interactions, and stressful life circumstances. The Cronbach α for the Total Stress Scale was 0.96.

Maternal general health. Maternal general health was assessed by the General Health Questionnaire—28 (Goldberg & Williams, 1988). In the General Health Questionnaire each mother was asked to compare her recent psychological state with her usual state. The Cronbach α for the total score was 0.90.

Parental education. Ten (21%) of the adoptive mothers and 38 (79%) of the adoptive fathers had primary education only. Thirty-eight (79%) of the adoptive mothers and 38 (79%) of the adoptive fathers had secondary or tertiary education.

Stressful events in the lives of the adolescents.

Death of a parent. Two adopted boys lost their mothers (one lost his mother 1 year before our visit and the other 6 years before). One adopted boy lost his father 4 years before. One comparison boy lost his father 8 years before.

Parental divorce. Five (10%) adopted adolescents and five (14%) comparison adolescents experienced parental divorce.

Serious health problems of the adolescents. Two adopted girls and one comparison girl had serious health problems.

Serious health problems of the parent(s). Four adoptive parents had cancer during the previous 5 years and one comparison father had a heart attack 10 years before.

Moving. Fourteen (33%) adopted and 17 (47%) comparison adolescents moved out of a house ($\chi^2 = 3.84, p = .069$). Five (10%) adopted and 3 (8%) comparison adolescents moved away from a town ($\chi^2 = 0.04, p = 1.000$).

Biological mother circumstances

Reason for admission to the institution. Half of the adopted adolescents ($n = 26, 50%$) were left in the institution for socioeconomic reasons, whereas the rest were placed in the

institution because of maternal mental retardation, mental illness, epilepsy, or drug addiction.

Education of the biological mothers of the adopted children. One biological mother (3%) was illiterate and 14 biological mothers (47%) had primary education only. Fifteen (50%) biological mothers had finished secondary school or had technological education. None had tertiary education. No information was available on the education of 22 (42%) of the 52 biological mothers.

Data collection procedures

All families were contacted by phone by P.V., who was the main investigator in the previous stages of the study and was known to the families. Parents were informed about the purpose of the present study and the data collection procedures. Parents and adolescents who agreed to participate were visited at their homes; the appointment time was set by the parents. Parents and adolescents who participated in the study signed a consent form that specified the participants' right to withdraw from the study at any time without adverse consequences. Ethical approval was obtained from the Research Committee of the Aristotle University of Thessaloniki, in order to ensure that the research conformed to ethical principles and standards.

Families who moved house were traced through the telephone directory. In seven (13%) cases that could not be traced, the families were contacted by the social workers of Metera Babies Centre, after which they agreed to participate in the study.

The families were visited by the two investigators (P.V. and M.N.); M.N. was unaware which group each adolescent belonged to and gathered the data from the adolescents. Adolescents' mothers completed three questionnaires. Each home visit lasted 2–3 hr.

Research Plan

In common with all studies of any kind of adversity, there were substantial individual differences in outcome among children who were adopted. Rather than focus on individual outcome variables, in order to study the possible predictors of this heterogeneity, and in particular the predictors of resilience, four developmental outcomes in adolescence were taken into account and combined: first, the quality of attachment as reflected in both emotional openness and security of attachment; second, cognitive performance (including IQ and school performance as reported by teachers); third, hyperactivity as rated in a composite score using multiple sources of ratings; and fourth, a request for psychological help or psychiatric treatment.

The scores in the four outcome factors were summed, giving rise to a total composite score outcome ranging from 0 to 4, with high scores indicating more negative developmental outcomes. A good developmental outcome was designated

by positive scores on at least three out of the four predictors, a bad outcome by those who had no positive outcomes or a positive outcome on only one of the four factors, and in the middle were those who scored positively on two out of the four. Scored in this way, 18 adoptees showed good outcomes, 17 were in the middle, and 13 had poor outcomes.

The predictive variables comprised three domains. In the first there were the biological mother's circumstances, comprising the reasons for the child's admission to the institution and the educational level of the biological mother. The second domain of institutional features concerned whether the child left the institution for adoption after the age of 2 years and whether there was disorganized attachment in the quality of institutional rearing as experienced at an individual level while in Metera. The third set of features concerned various aspects of the qualities of the adoptive home. This included first, maternal health in adolescence; second, maternal education; third, paternal education; and fourth, the presence of stressful events in the adolescent's life, such as illness of the parents or the adolescent, parental divorce, or death of a parent. Each of these features was treated as a dimension and given a score.

Results

All previous studies of stress or adversity have shown marked heterogeneity in outcomes (Rutter, 2006). The findings on attachment relationships, cognition, and behavior (Vorria, Ntouma, & Rutter, 2014a, 2014b; Vorria et al., 2015) showed substantial heterogeneity in outcomes with respect to individual variables, but that does not mean that the same would be found for an overall outcome putting together all the key individual variables. Associations across these variables were quite modest. Thus, individuals doing well on attachment did not necessarily do well on cognitive functioning or hyperactivity. It was therefore quite possible that a good outcome on one variable might be counterbalanced by a poor outcome on a different variable, resulting in little overall variation when variables were combined.

Overall outcomes

In order to test that possibility, the four key outcomes were selected, in each case using multiple sources of measurement when available. Thus, the quality of attachment was measured by both emotional openness and security of attachment; cognitive performance by measured IQ and school performance reported by teachers; hyperactivity as a composite score based on child, parent, and teacher ratings; and request for either psychological help or psychiatric treatment. The scores on these four domains were treated as either 0 (no poor outcome on an indicator in that domain) or 1 (any poor outcome in that domain). The scores in the four domains were then summed, giving rise to a total composite score ranging from 0 to 4, with high scores representing more negative outcomes (note that the means and the standard deviations were generally comparable for the four domains).

Table 1. Positive outcomes in the two groups

No. of Positive Outcomes	Adopted Adolescents	Comparison Adolescents
All 4 domains	8 (1 boy)	8 (2 boys)
3/4 domains	14 (8 boys)	14 (7 boys)
2/4 domains	17 (11 boys)	10 (7 boys)
1/4 domains	7 (4 boys)	3 (1 boy)
No domain	6 (3 boys)	1 (1 boy)
Total	52	36

Table 1 shows the number of positive outcomes in the two groups. The mean of 1.83 ($SD = 0.81$) in the adopted group was marginally higher (meaning worse) than the mean of 1.50 ($SD = 0.70$) in the comparison group, the difference falling just short of statistical significance at the 5% level, $t(86) = 1.97; p = .052$. However, there was a rather larger difference at the extremes (pooling the two extreme categories in each case). Thus, twice as many adoptees had a positive outcome on no more than one domain (25.0% vs. 11.1%) and fewer had a positive outcome on three or four domains (42.3% vs. 66.1%). Nevertheless, both comparisons were statistically nonsignificant, as shown by Fisher’s exact test ($p = .128$ and $.169$, respectively). In addition, there was not a significant difference between the positive outcomes for boys and girls.

Following on Table 1 and Table 2, a good overall outcome was defined as a positive (good) score on at least three of the four domains, an intermediate outcome as two out of the four, and a poor outcome as zero or one out of the four. Because 13 adolescents (4 adopted, 9 comparisons) were unclassified in the Strange Situation procedure, Table 2 deals only with the 48 adoptees and 27 of the comparison group with complete data. The mean scores for the three domain predictors are shown for the three levels of overall outcome. There were no differences with respect to good outcomes with respect to either the biological mother’s circumstances $t(46) = -0.53, p = .596$, or the qualities of the adoptive home, $t(46) = 11.32, p = .193$. By contrast, there was a significant effect of the institutional domain predictors. The adoptees with a good outcome ($n = 18$) had a significantly lower

Table 2. The mean scores of the three levels of overall outcome for the three domain predictors

Predictor Domains	Overall Composite Outcome		
	Good ($n = 18$)	Intermediate ($n = 17$)	Poor ($n = 13$)
	Mean (SD)	Mean (SD)	Mean (SD)
Biological mother	1.11 (0.76)	1.00 (0.79)	1.54 (0.66)
Institution	0.67 (0.69)	0.94 (0.75)	1.46 (0.52)
Adoptive home	0.94 (0.80)	1.29 (0.85)	1.23 (0.83)

mean score (mean = 0.67, $SD = 0.69$) compared with the rest ($n = 30$; mean = 1.17, $SD = 0.70$). The t value (46) of 2.42 was statistically significant at the 2% level. The individually measured institutional experiences showed that the 27 subjects with relatively good experiences had a mean score of 1.63 on the total outcome versus 2.11 for those with relatively poor experiences (a high score representing a more negative outcome), but this difference was not statistically significant: $F(1, 44) = 1.79, p = .188$.

The predictors of a poor outcome were then examined in the same way. Once more, the outcome groups did not differ on the qualities of the adoptive home, $t(46) = -0.43, p = .668$. There was a trend that fell just below the 5% level of significance for adoptees with a poor outcome to have a higher (i.e., more negative) score on the biological mother predictors ($n = 13$, mean = 1.54, $SD = 0.66$) as compared with the rest ($n = 35$, mean = 1.06, $SD = 0.77$), with a $t(46)$ of -2.00 , giving rise to a p value of $.051$. However, once more, the biggest effect came from the institutional predictors, where those with poor outcomes ($n = 13$, mean = 1.46, $SD = 0.75$) had a significantly higher score than the rest ($n = 35$, mean = 0.80, $SD = 0.77$, with a $t(46)$ of -3.03 , giving rise to a p value of $.004$.

The point of examining the predictors of a good outcome separately from those of a poor outcome was to check whether there might be features associated with resilience that played no role in vulnerability. However, there was no evidence that that was the case. The variables that predicted good outcomes were much the same as those that predicted poor ones.

It was then checked whether the main institutional effect derived from disorganization of attachment or the length of time in the institution. The latter proved to make a unique statistically significant contribution, $b = 0.78; t(2, 47) = 2.24, p = .03$. Thus, more than 2 years in the institution predicted a negative overall outcome in adolescence. Disorganized attachment, by contrast, did not have a significant effect once time in the institution had been taken into account, $b = 0.65; t(2, 47) = 1.88, p = .066$. In contrast, when a regression analysis was undertaken for the combined overall outcome, it was found that there was not a significant effect of length of time in the institution in the absence of disorganized attachment. Conversely, there was no effect of disorganized attachment in either the group in institutional care that lasted less than 2 years or in the group that were in institutional care for more than 2 years. That is, the two variables were too closely associated for their relative effects to be compared through this form of analysis.

Specific outcomes

For the most part, the predictors of individual differences in specific outcomes closely mirrored those of the overall composite outcome. Here, the focus is on the four instances in which there were possible differences. The only differences with respect to the quality of attachment is that disorganization of attachment in infancy did have a just-significant effect (at the 5% level) on increasing the likelihood of insecurity of attachment in adolescence ($B = 1.24, Wald = 3.91, p =$

.048), and an age of 2 years or more at the time of adoption predicted a worse score on emotional openness. There was an $F(2, 49)$ of 5.22 ($p = .009$). The 20 children adopted at over the age of 24 months had a mean score of 4.35 ($SD = 2.21$), the 15 adopted between 17 and 24 months had a mean score of 6.30 ($SD = 1.58$), and the 17 adopted below the age of 17 months had a mean score of 5.88 ($SD = 1.79$).

The reason for admission had no effect on the Bayley mental scale in infancy, a significant effect on the McCarthy General Cognition index at age 4 years, and an effect on the WISC IQ in adolescence (mean = 109 vs. 102) that fell just short of statistical significance at 5% level. The problem with the interpretation of this finding is that the admission of the child because of maternal mental disorder combines a heterogeneous mixture of disorders, some of which may well have involved mainly environmental mediation (as would be the case with maternal alcoholism or drug addiction), whereas others may have mainly reflected some type of genetic influence.

The adopted mother's educational level was significantly associated with the children's cognitive outcome. The 10 adolescents reared by mothers who had only primary education had a significantly lower mean IQ of 97.10 ($SD = 17.72$) than those reared by a mother with secondary or tertiary education, for whom the mean was 107.76 ($SD = 12.75$), giving rise to a $t(49)$ of 2.19 and a p value of .033. However, there was no effect of the educational level of the biological mother, $t(35) = -1.56$, $p = .127$. It is striking that this was so, despite there being a degree of selective placement.

There were no significant predictors of hyperactivity in adolescence, but the length of time in institutional care (i.e., 2 years or more) did have a significant effect on increasing the likelihood of referral to psychological and psychiatric services in adolescence ($B = 1.50$, Wald = 5.43, $p = .02$).

In summary, it is clear that the findings on the predictors of individual differences in the composite overall outcome were not driven or distorted by an effect on any individual specific outcome.

What provides the risk?

Up to this point, the overall experience of early institutional rearing has been treated as the source of risk, in line with all previous research. However, the finding on the predictive importance of duration of institutional care raised the question as to whether it would make more sense to treat the risk as applying only to institutional care lasting longer than 2 years. In order to examine this possibility, it was necessary to turn to case-control comparisons as shown in Tables 3 and 4. Those adoptees who remained in Metera for more than 2 years ($n = 17$) differed markedly and significantly on the overall outcome measure (as well as on seeking psychological help; see Table 3). In sharp contrast, there were no significant differences in outcome for those whose stay in Metera lasted less than 2 years (see Table 4). The logic, therefore, was to re-define the risk as deriving from institutional care exceeding 2 years.

Table 3. Differences on outcomes between the adopted adolescents living in the institution more than 2 years and the control group

	Adopted and >2 Years ($n = 17$)	Control Group ($n = 36$)	F	p
	Mean ^a (SD)	Mean (SD)		
Combined outcome on attachment	0.71 (0.47)	0.42 (0.50)	4.01	.051
Combined outcome on cognitive performance	0.53 (0.51)	0.47 (0.51)	0.14	.704
Outcome on hyperactivity	0.53 (0.51)	0.22 (0.42)	5.31	.025
Outcome on psychological help	0.65 (0.49)	0.19 (0.40)	12.67	.001
Overall outcome	2.41 (1.18)	1.31 (1.01)	12.48	.001

^aThe higher the score, the more negative the outcome.

The question then is what variables predicted individual differences within the subsample of 17 who remained in institutional care beyond the age of 2 years. It is obvious, unfortunately, that this subsample was far too small for statistical analyses. However, the analyses were undertaken in order to consider possible leads on effects that had not been evident in the original total sample. The only suggestions found were that the educational level of the biological mother might have an effect on the cognitive outcome and that disorganized attachment might have an effect on attachment features. However, in view of the inevitable uncertainty of findings based on such a small subsample, no details are given here. They are mentioned only as features to be considered in other studies with a larger sample.

Table 4. Differences on outcomes between the adopted adolescents living in the institution less than 2 years and the control group

	Adopted and <2 Years ($n = 35$)	Control Group ($n = 36$)	F	p
	Mean ^a (SD)	Mean (SD)		
Combined outcome on attachment	0.40 (0.50)	0.42 (0.50)	0.02	.888
Combined outcome on cognitive performance	0.40 (0.50)	0.47 (0.51)	0.37	.546
Outcome on hyperactivity	0.43 (0.50)	0.22 (0.42)	3.52	.065
Outcome on psychological help	0.26 (0.44)	0.19 (0.40)	0.39	.534
Overall outcome	1.49 (1.21)	1.31 (1.01)	0.51	.479

^aThe higher the score, the more negative the outcome.

Discussion

Six main findings stand out. First, as hypothesized, there was substantial heterogeneity in outcome; some adopted adolescents were functioning very well, but a few were showing relatively poor functioning. Second, although there were a few differences between the adoptees and the comparison group on individual aspects of outcome, there was no significant difference in the overall outcome (as assessed from a composite measure combining different aspects of functioning), although the overall outcome for the adoptees was not quite as good. The finding emphasizes the value of assessing outcome in a multifaceted fashion. Third, variations in the post-adoption rearing experience (at least as measured) did not account for individual differences in overall outcome. There is every reason to suppose that adoption brought real and worthwhile benefits, but there was a limited range of variation in the adoptive homes, and the small variations within that range did not seem to account for the heterogeneity of outcome. Fourth, variations in the biological background seemed to have only a relatively small effect, but this conclusion needs to be tempered by an appreciation that our data on this feature were less than ideal. Fifth, far and away the strongest predictor of individual differences in overall outcome concerned institutional experiences that lasted beyond the age of 2 years. The outcome in adolescence for individuals who remained in Metera that long was markedly and significantly worse than that for those in day-care comparison group. The power of this variable more than a decade after adoption was striking. By contrast, no between-group differences in outcome were evident for those whose institutional care lasted less than 2 years. Sixth, there were substantial individual variations in the quality of institutional care experienced, but these had only a non-significant effect on outcome.

Our finding is in line with the Romanian study (Nelson et al., 2014) finding of a stepwise increase in ill effects at about 2 years of age. It appears that the risks associated with early institutional care that does *not* continue after 2 years have been overestimated in the past. Of course, that is not to say that early institutional care does not matter if it ceases by age 2 years. Attachment disorganization in the institution still had some modest predictive power beyond that found for duration of institutional care (Vorria et al., 2015). We continue to argue that every effort should be made to place children in adoptive homes as soon as possible after the necessary checks have been made. On the other hand, the risks associated with early institutional care should not be exaggerated. We conclude that it would be worthwhile to explore further the role of individual differences in the ways in which institutional care impinged on individual children, but a better instrument than the PCIS will be needed to do this.

Strengths and Limitations

The study has five major strengths. First, it focuses on the outcome of adopted children who had experienced an early insti-

tutional rearing that lacked individualized care but which did not involve either pervasive general abuse/neglect or subnutrition. Second, the study was distinctive (probably unique) in involving a prospective longitudinal study that began in infancy while the children were in the institution (Metera) and continued postadoption, initially at age 4 years and then at 13 years. There was a comparison group of children who did not experience institutional care and who were studied in the same way but the prospective nature of the design meant that within-individual change could be measured, as well as between-group comparisons. Third, there was a standardized measurement of institutional rearing as it impinged on each child, allowing analysis of the effects of individual differences in the quality of institutional care. Fourth, both outcome and mediators of outcome were measured using multiple methods. Fifth, outcome was assessed on the basis of four domains of outcome allowing determination of effects on positive as well as negative outcomes and possible differences in the predictors of different outcome features.

However, there were limitations. First, outcome measures extended only up to 13 years, leaving uncertainty regarding the extent to which the situation might change when the child is older. A further follow-up is planned to deal with that question. Second, whereas there was reasonably good measurement of the duration and quality of institutional care, there was very little known about the children's biological background or about possible genetic influences. Third, there was limited variation in the qualities of the adoptive home. The conclusions regarding the importance of institutional influences are reasonably solid, but those on the lesser importance of biological background and experiences postadoption are less so.

Conclusions

There are several policy/practice implications that stem from the findings of this follow-up study. The young people's outcomes in adolescence were highly variable. Such variability was not a function of individual differences in the quality of the adoptive home, at least as far as it was possible to assess it. We presume that that finding is contingent on an adequate screening of prospective adoptive parents in order to rule out those likely to present a high environmental risk to the child. In other words, our finding on the lack of effect of variations among adoptive families should not be interpreted as meaning that an appropriately based screening is not needed. The strongest predictor of a poor overall outcome was adoption after the age of 2 years. Currently, in European countries too many adoptions are delayed for years in order to obtain a "perfect match," and our findings suggest that this is a policy likely to provide risks for the children if placement is not obtained before the age of 2 years. Good empirical evidence on the benefits of matching is largely lacking. Infants being placed for adoption have a right to expect placement in a good, loving family, but it is not in their interest that the placement process drag on with the infants' remaining in the institution.

References

- Bibou-Nakou, I., Kiosseoglou, G., & Stogiannidou, A. (2002). Strengths and Difficulties Questionnaire in the school population. In A. Roussou (Ed.), *Psychometric issues in clinical practice and research* (pp. 208–220). Athens, Greece: Ellinika Grammata.
- Cicchetti, D. (2010). Resilience under conditions of extreme stress: A multi-level perspective. *World Psychiatry, 9*, 145–154.
- Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology, 8*, 597–600.
- Cicchetti, D., Rogosch, F. A., Lynch, M., & Holt, K. D. (1993). Resilience in maltreated children: Processes leading to adaptive outcome. *Development and Psychopathology, 5*, 629–647.
- Cicchetti, D., & Toth, S. L. (2009). The past achievements and future promises of developmental psychopathology: The coming of age of a discipline. *Journal of Child Psychology and Psychiatry, 50*, 16–25.
- Cohen, S., & Williamson, G. M. (1991). Stress and infectious disease in humans. *Psychological Bulletin, 109*, 5–24.
- Farran, D., Kasari, C., Comfort, M., & Jay, S. (1986). *Parent/Caregiver Interaction Scale*. Chapel Hill, NC: University of North Carolina Press.
- Georgas, D. D., Paraskevopoulos, I. N., Bezevegis, I. G., & Giannitsas, N. D. (1997). *Greek WISC-III: Wechsler Intelligence Scale for Children*. Athens, Greece: Ellinika Grammata.
- Goldberg, D., & Williams, P. (1988). *General Health Questionnaire*. Windsor Berkshire: Nfer–Nelson.
- Goodman, R. (1994). A modified version of the Rutter Parent Questionnaire including extra items on children's strengths: A research note. *Journal of Child Psychology and Psychiatry, 35*, 1483–1494.
- Julian, M. M. (2013). Age at adoption from institutional care as a window into the lasting effects of early experiences. *Clinical Child & Family Psychology Review, 16*, 101–145.
- Kumsta, R., Rutter, M., Stevens, S., & Sonuga-Barke, E. J. (2010). Risk, causation, mediation, and moderation. *Monographs of the Society for Research in Child Development, 75* (1, Serial No. 295), 187–211.
- Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development, 71*, 543–562.
- Masten, A. S. (2014). Global perspectives on resilience in children and youth. *Child Development, 85*, 6–20.
- Masten, A. S., & Cicchetti, D. (2010). Developmental cascades. *Development and Psychopathology, 22*, 491–495.
- McCall, R. B. (2013). Review: The consequences of early institutionalization: Can institutions be improved? Should they? *Child and Adolescent Mental Health, 18*, 193–201.
- National Research Council. (2001). *New horizons in health: An integrative approach*. Washington, DC: National Academy Press.
- Nelson, S., Fox, N. A., & Zeanah, C. H. (2014). *Romania's abandoned children: Deprivation, brain development, and the struggle for recovery*. Cambridge, MA: Harvard University Press.
- Rutter, M. (1972). *Maternal deprivation reassessed*. Harmondsworth: Penguin Books.
- Rutter, M. (2006). Implications of resilience concepts for scientific understanding. *Annals of the New York Academy of Sciences, 1094*, 1–12.
- Rutter, M. (2012). Resilience as a dynamic concept. *Development and Psychopathology, 24*, 335–344.
- Rutter, M. (2013). Annual research review: Resilience—Clinical implications. *Journal of Child Psychology and Psychiatry, 54*, 474–487.
- Rutter, M., Kreppner, J., O'Connor, T., & ERA Study Team (2001). Specificity and heterogeneity in children's responses to profound privation. *British Journal of Psychiatry, 179*, 97–103.
- Rutter, M., Sonuga-Barke, E. J. S., Beckett, C., Castle, J., Kreppner, J., Kumsta, R., et al. (2010). Deprivation-specific psychological patterns: Effects of institutional deprivation. *Monographs of the Society for Research in Child Development, 75*(1, Serial No. 295).
- Sattler, J. M. (1992). *Assessment of Children WISC-III and WPPSI-R supplement*. San Diego, CA: Author.
- Sheras, P. L., Abidin, R. R., & Konold, T. R. (1998). *Stress Index for Parents of Adolescents: Professional manual*. Lutz, FL: Psychological Assessment Resources.
- St. Petersburg–USA Orphanage Research Team. (2008). The effects of early social-emotional and relationship experience on the development of young orphanage children. *Monographs of the Society for Research in Child Development, 73*(3, Serial No. 291).
- Target, M., Fonagy, P., & Shmueli-Goetz, Y. (2003). Attachment representations in school-age children: The development of the Child Attachment Interview (CAI). *Journal of Child Psychotherapy, 29*, 171–186.
- Tizard, J., Sinclair, I., & Clarke, R. V. G. (1975). *Varieties of residential experience*. London: Routledge & Kegan Paul.
- Vaillant, G. E. (2013). *Triumphs of experience: The men of the Harvard Grant Study*. Cambridge, MA: Harvard University Press.
- van IJzendoorn, M. H., Palacios, J., Sonuga-Barke, E. J., Gunnar, M. R., Vorria, P., McCall, R. B., et al. (2011). Children in institutional care: Delayed development and resilience. *Monographs of the Society for Research in Child Development, 76*(4), 8–30.
- Vorria, P., Ntouma, M., & Rutter, M. (2014a). The cognitive development and school achievement of adopted adolescents. The Greek “Metera” study. *European Journal of Developmental Psychology*. doi:10.1080/17405629.2014.933703
- Vorria, P., Ntouma, M., & Rutter, M. (2014b). The behaviour of adopted adolescents who spent their infancy in residential group care: The Greek “Metera” study. *Adoption & Fostering, 38*, 271–283.
- Vorria, P., Ntouma, M., Vairami, M., & Rutter, M. (2015). *Attachment relationships of adolescents who spent their infancy in residential group care: The Greek “Metera” study*. Manuscript submitted for publication.
- Vorria, P., Papaligoura, Z., Dunn, J., van IJzendoorn, M. H., Steele, H., Kontopoulou, A., et al. (2003). Early experience and attachment relationships of Greek infants raised in residential group care. *Journal of Child Psychology and Psychiatry, 44*, 1208–1220.
- Vorria, P., Papaligoura, Z., Sarafidou, J., Kopakaki, M., Dunn, J., van IJzendoorn, M. H., et al. (2006). The development of adopted children after institutional care: A follow-up study. *Journal of Child Psychology and Psychiatry, 47*, 1246–1253.