Behavior Problems and Mental Health Referrals of International Adoptees

A Meta-analysis

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Context International adoption involves more than 40 000 children a year moving among more than 100 countries. Before adoption, international adoptees often experience insufficient medical care, malnutrition, maternal separation, and neglect and abuse in orphanages.

Objective To estimate the effects of international adoption on behavioral problems and mental health referrals.

Data Sources We searched MEDLINE, PsychLit, and ERIC from 1950 to January 2005 using the terms *adopt** combined with (*behavior*) *problem*, *disorder*, *(mal) adjustment*, *(behavioral) development*, *clinical* or *psychiatric (referral)*, or *mental health*; conducted a manual search of the references of articles, books, book chapters, and reports; and consulted experts for relevant studies. The search was not limited to English-language publications.

Study Selection Studies that provided sufficient data to compute differences between adoptees (in all age ranges) and nonadopted controls were selected, resulting in 34 articles on mental health referrals and 64 articles on behavior problems.

Data Extraction Data on international adoption, preadoption adversity, and other moderators were extracted from each study and inserted in the program Comprehensive Meta-analysis (CMA). Effect sizes (*d*) for the overall differences between adoptees and controls regarding internalizing, externalizing, total behavior problems, and use of mental health services were computed. Homogeneity across studies was tested with the *Q* statistic.

Data Synthesis Among 25 281 cases and 80 260 controls, adoptees (both within and between countries) presented more behavior problems, but effect sizes were small (*d*, 0.16-0.24). Adoptees (5092 cases) were overrepresented in mental health services and this effect size was large (*d,* 0.72). Among 15 790 cases and 30 450 controls, international adoptees showed more behavior problems than nonadopted controls, but effect sizes were small (*d*, 0.07-0.11). International adoptees showed fewer total, externalizing and internalizing behavior problems than domestic adoptees. Also, international adoptees were less often referred to mental health services (*d*, 0.37) than domestic adoptees (*d*, 0.81). International adoptees with preadoption adversity showed more total problems and externalizing problems than international adoptees without evidence of extreme deprivation.

Conclusions Most international adoptees are well-adjusted although they are referred to mental health services more often than nonadopted controls. However, international adoptees present fewer behavior problems and are less often referred to mental health services than domestic adoptees.

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INTERNATIONAL ADOPTION IS AN increasing phenomenon involving more than 40 000 children a year moving between more than 100 countries.[1,2] By setting uniform norms and standards, the 1993 Hague Convention[3] endorsed and facilitated international adoption. International adoption may offer the advantage of a permanent family to a child for whom a family cannot be found in the country of origin. In 2004, most international adoptions in the United States (22 884) were from China, Russia, Guatemala, South Korea, and Kazakhstan,[4] whereas most international adoptions in Europe (15 847 in 2003) were from China, Russia, Colombia, Ukraine, and Bulgaria.[2] Since the 1970s, domestic adoptions in North America and Europe drastically decreased, whereas at the same time the number of international adoptions increased.[1]

International adoptees often experience inadequate prenatal and perinatal medical care, maternal separation, psychological deprivation, insufficient health services, neglect, abuse, and malnutrition in orphanages or poor families before adoptive placement.[5-7] Animal models have shown that early maternal

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separation and deprivation can seriously harm infant functioning and later development.[8,9] Psychological deprivation in orphanages can result in maladjustment in children.[6,7,10] In addition, after adoptive placement, adoptees have to cope with integrating the loss of their culture and birth family into their lives.[11] In contrast to domestic adoptees who are adopted within the same country, international adoptees may face problems regarding their divergent identity,[12] as most international adoptees are raised by parents who do not share their racial and cultural background.

Adoption usually offers improved medical, physical, educational, and psychological opportunities for institutionalized children,[13,14] and research has documented children's substantial recovery from deprivation after adoption,[14,15] which may partly be due to the possibility that some adopted children were selected for adoption because they seemed brighter or had better social skills. Nevertheless, several studies found that adopted children were overrepresented in mental health populations and showed more externalizing disorders.[16] Some studies found more mental health problems in international adoptees compared with nonadopted controls, in particular in male adoptees,[7,17] in adolescence,[7,18,19] and in children placed beyond infancy.[20,21] However, the majority of adoptees were functioning well.[7,15,22] In a large national cohort study in Sweden involving more than 11 000 international adoptees, a significantly higher risk of suicide, psychiatric illness, and social maladjustment was found compared with nonadopted controls although most adoptees were doing well.[18] The authors stated that further studies with less severe outcomes are needed as the main differences between adoptees and nonadopted controls were found in only a small number of international adoptees.

We report the first meta-analyses on behavior problems and mental health referrals of international adoptees comparing them to nonadopted controls and domestic adoptees. We hypothesized that international adoptees present more behavior problems and are referred to mental health services more often than nonadopted controls[16] or domestic adoptees.[5,12,18] We hypothesized that those with preadoption adversity,[6,15] older ages at international adoptive placement (>12 months),[20,21] and males[7,17] would have an increased risk for behavior problems and mental health referrals. International adoptees were also expected to show more behavior problems in adolescence compared with the years before adolescence.[7,18] We studied domestic adoptions in Western countries only because the increasing domestic adoptions in developing countries, eg, India,[23] have not been systematically studied yet.

METHODS

Selection of Studies

The guidelines published by Stroup et al[24] for the meta-analysis of observational studies were followed. The aims of our meta-analysis were (1) to compare all adoptees with nonadopted controls; (2) to compare international adoptees with nonadopted controls; (3) to compare international adoptees with domestic adoptees; and (4) to examine moderators for the international adoption outcomes. Empirical studies documenting adoptees' behavior problems and use of mental health services were collected systematically, using 3 search strategies.[25] First, MEDLINE (US National Library of Medicine), PsychLit (Psychological Literature), and ERIC (Education Resource Information Center) were searched for case-control studies published between 1950 and January 2005 with the key words *adopt**, combined with *(behavior) problem(s)*, *disorder(s)*, *(mal)adjustment*, *(behavioral) development*, *clinical* or *psychiatric (referral)*, or *mental health*. Second, the references of the collected journal articles, books, book chapters, and reports were searched for relevant studies. Third, experts in the field were asked for relevant studies. The search was not limited to English-language publications. Our selection criteria were broad in order to include as many studies as possible. Adoptees in all age groups were included, from early childhood through adulthood. In case of a longitudinal study, the first assessment with adequate data was used to ensure that every adoptee was counted only once in the pertinent meta-analyses. Similarly, a study sample described in several articles or chapters was used only once. We included studies using the Child Behavior CheckList[26] or related measures to measure problem behavior. Studies involving clinically referred adoptees were included in so far as their rate of mental health referrals could be compared with the rate of adoptees in the general population. We excluded studies that exclusively sampled adopted children exposed to alcohol or drugs in utero,[27] physically or mentally handicapped children, and other special needs children, such as hard-to-place children.[28]

Data Extraction

Data were entered into a customized meta-analytic database. We used a detailed coding system to extract from every study data on sample characteristics, design, publication outlet, and information on behavioral problems or mental health referrals. Study characteristics and study results were coded independently. The main coder of the study characteristics was blinded to the meta-analytic study results and had no previous familiarity with the adoption field.

The following sample characteristics were extracted: sex, age at adoptive placement, age at assessment, duration of time with the adoptive family, evidence that the participants in the study were international adoptees, and evidence of preadoption adversity. If available, we included findings for males and females (in case this was not reported, the study was placed in the category of mixed) or different age groups separately, considering these groups as subsamples of the same study. We coded whether the adoptees were placed for adoption between 0 and 12 months, 12 and 24 months, or older than 24 months (or NA, not available, if data were not reported or extractable). We also coded the participants' age at the time of the assessment: be-

tween 0 and 4 years, 4 and 12 years, 12 and 18 years, or older than 18 years (or NA). We coded whether the adoptees had been with the adoptive family for 0 to 4 years, more than 4 to 8 years, more than 8 to 12 years, or more than 12 years. We also extracted whether the adoptees were placed internationally or not. Studies were coded as an international adoption study if the report indicated that all participants were adopted internationally. Preadoption adversity was coded if at least 50% of a sample experienced extreme deprivation, such as serious neglect, malnutrition, and/or abuse. As most adoptees experienced at least some deprivation before adoptive placement and because preadoption histories were not known with certainty in most cases, our index of adversity must be considered as a proxy for the most extreme preadoption circumstances.

The following design characteristics were extracted: whether a nonadopted norm group (eg, Child Behavior Checklist norms) or other control group (a general population sample, classmates, or siblings) was used in the study, and the sample sizes of the adoption and control group. Studies that did not include a nonadopted control group were not included in the meta-analysis. Also, country of study was extracted, distinguishing between studies conducted in North America vs other countries. Finally, year of publication was extracted, analyzing studies published before 1959, during 1960-1969, 1970-1979, 1980-1989, and 1990 or later. Quality of study, as outlined for experimental research,[29,30] was not coded because some crucial criteria, eg, randomization, are not applicable to nonexperimental research. However, sample size was accounted for in the study outcomes and publication outlet was coded as proxy of study quality.[14] Publication outlet was assessed by distinguishing between studies published in refereed scientific journals and in other scientific reports, books, and book chapters. Peer-reviewed journals may set higher standards than nonrefereed outlets. Alternatively, scientific journals may be more hesitant in accepting studies with small sample sizes, nonsignificant outcomes (resulting in a publication bias, see below), or both than books or chapters.

We extracted information on behavior problems, mental health referrals, or both. For behavior problems, we distinguished between total problems, externalizing problems (eg, aggression, delinquency, hyperactivity), and internalizing problems (eg, withdrawn, anxious or depressed).[26] In several studies, scores for externalizing problems and internalizing problems were reported but scores for total behavior problems were lacking. In those cases, a weighted average score was constructed for total problems based on the scores for externalizing and internalizing problems because externalizing and internalizing problems are considered as adequately representing total problems.[31] We also coded for whether the study involved a referred adoption group (eg, referred to a psychiatric clinic), and if so, whether the rate of overrepresentation of mental health referrals could be computed (ie, percentage of adoptees in the clinic population vs percentage of adoptees in the general population). Satisfactory intercoder reliabilities were established (89%; range, 75%-100%; $k = 20$).

Statistical Methods

The various statistics in the adoption studies were recomputed with Mullen's advanced basic meta-analysis program[25] and transformed into Cohen *d*.[32] For each study we thus calculated an effect size (Cohen *d*): the standardized difference between the means of the adoptive and the nonadoptive group. According to Cohen's[32] criteria, *d*s of <0.20 are considered small effects; *d*s of about 0.50, moderate effects; and *d*s of about 0.80, large effects. The resulting set of effect sizes were inserted in the Comprehensive Meta-Analysis (CMA, version 1.025) program[33] that computed fixed as well as random-effect model parameters and 95% confidence intervals (CIs) around the point estimate of an effect size. The *Q* statistics (provided by CMA) were used to test the homogeneity of the specific set of effect sizes and the significance of moderators.[25,33] The set of international adoption studies was homogeneous; therefore, we decided to use the combined effect sizes in the context of the fixed-effect models in the meta-analyses of international adoptees. In the total set of studies (international and domestic adoption), random-effect models were used as several subsets were heterogeneous.[34] In the random-effect models, we computed 85% CIs around the point estimate of each set of effect sizes. When testing moderators, inspection of the overlap between these CIs provided a test of the differences between the combined effects of subsets of study effect sizes grouped by moderators. This approach of comparing 85% CIs served as the significance test in the context of a random-effect model for which the *Q* statistics are not an adequate index of significance of differences.[14,35] Nonoverlapping 85% CIs were considered to indicate a significantly different effect size in subsets of study outcomes.[14] Winsorizing was used to redress outlying sample sizes.[36] Also, combined effect sizes and confidence boundaries were recomputed removing 1 study at a time. This method to test the stability of the outcomes is similar to a jackknife procedure that takes an entire sample except for 1 value, and then calculates the test statistic of interest. It repeats the process, each time leaving out a different value, and each time recalculating the test statistic.[33]

We used 1 of the methods developed to estimate potential publication bias, namely, the *trim-and-fill* method (available in CMA[33]). Using this method, a funnel plot is constructed of each study's effect size against its precision (1/SE). These plots should be shaped like a funnel if no publication bias is present. However, since smaller or nonsignificant studies are less likely to be published, studies in the bottom left-hand corner of the plot are often omitted.[37,38] For the meta-analyses the right-most

studies considered to be symmetrically unmatched were trimmed. The trimmed studies were then replaced and their missing counterparts imputed or filled as mirror images of the trimmed outcomes. This then allowed for the computation of an adjusted effect size and CI.[38,39] Also, a fail-safe number was computed, ie, the number of studies (*k*) that would be needed to change a significant combined effect size into a nonsignificant outcome.[25]

Table 1. Case-Control Studies With Behavioral Data

Source	No. of Adoptees-No. of Nonadopted Controls	Age at Adoption, mo	Age at Assessment, y	Study Population	Country of Study	Type of Diagnostic Tool	Type of Problem Behavior		
							Externalizing	Internalizing	Total
Andresen,[40] 1992	135-135	12-24	12-18	INT	Norway	Rutter (T)	NA	NA	Yes
Bagley,[41] 1991	20-20	>24	12-18	INT	Canada	Interview (P/C)	Yes	Yes	Yes*
	79-43	>24	12-18	. . .	Canada	Interview (P/C)	Yes	Yes	Yes*
Barth and Berry,[42] 1988	85-1300	>24	4-12	. . .	United States	CBCL	Yes	Yes	Yes*
Benson et al,[43] 1994	881-norm†	<12	12-18	. . .	United States	YSR	Yes	Yes	Yes
Berg-Kelly and Eriksson,[44] 1997	125-9204	<12	12-18	INT	Sweden	Q90	Yes	Yes	Yes*
Bogaerts and van Aelst,[45] 1998	70-758	12-24	12-18	INT	Belgium	CBCL	Yes	Yes	Yes*
Bohman,[46] 1970	168-norm†	<12	4-12	. . .	Sweden	Interview (T)	Yes	Yes	Yes*
Borders et al,[47] 1998	72-72	NA	4-12	. . .	United States	Survey	NA	NA	Yes
Borders et al,[48] 2000	100-70	NA	>18	. . .	United States	CES-D	NA	Yes	NA
Botvar,[49] 1994	384-6889	12-24	>18	INT	Norway	HSCL	NA	NA	Yes
Brand and Brinich,[50] 1999	174-10464	<12	NA	. . .	United States	BPI	NA	NA	Yes
Brodzinsky et al,[51] 1984	130-130	<12	4-12	. . .	United States	CBCL	Yes	Yes	Yes*
Brodzinsky et al,[52] 1993	61-62	<12	4-12	. . .	United States	CBCL	Yes	Yes	Yes*
Carey et al,[53] 1974	59-200	<12	0-4	. . .	United States	TQ	NA	NA	Yes
Castle et al,[54] 2000	50-norm†	<12	4-12	. . .	United Kingdom	Interview (P)	Yes	NA	NA
Cederblad et al,[22] 1999	211-norm†	<12	12-18	INT	Sweden	CBCL	Yes	Yes	Yes
Cermak and Daunhauer,[20] 1997	73-72	12-24	4-12	INT	United States	DSPQ	NA	NA	Yes
Cohen et al,[55] 1993	23-20	12-24	4-12	. . .	Canada	CBCL	Yes	Yes	Yes
Cook et al,[56] 1997	131-125	12-24	4-12	. . .	Europe	Rutter (P)	NA	NA	Yes
Dalen,[57] 2001	193-173	<12	12-18	INT	Norway	Rutter (T)	Yes	Yes	Yes*
Deater-Deckard and Plomin,[58] 1999	78-94	<12	4-12	. . .	United States	CBCL	Yes	NA	NA
De Jong,[59] 2001	116-norm†	>24	4-12	INT	New Zealand	CBCL	NA	NA	Yes
Dumaret,[60] 1985	35-35	<12	4-12	. . .	France	Rutter (T)	Yes	NA	NA
Fan et al,[61] 2002	514-17241	NA	12-18	. . .	United States	Interview (P/C)	Yes	Yes	Yes*
Feigelman,[62] 1997	101-6258	NA	12-18	. . .	United States	Interview	NA	Yes	NA
Fergusson et al,[63] 1995	32-842	<12	12-18	. . .	New Zealand	DISC	Yes	Yes	Yes*
Fisch et al,[64] 1976	94-188	<12	4-12	. . .	United States	BP	NA	NA	Yes
Fisher et al,[21] 1997	21-23	<12	0-4	INT	Canada	CBCL	Yes	Yes	Yes
Fisher et al,[21] 1997	34-23	12-24	0-4	INT	Canada	CBCL	Yes	Yes	Yes
Forsten-Lindman,[65] 1993	34-50	12-24	4-12	INT	Finland	BDGHI	Yes	NA	NA
Gardner et al,[66] 1961	29-29	<12	12-18	. . .	United States	CFMAS	NA	Yes	NA
Geerars et al,[67] 1995	68-756	<12	12-18	INT	The Netherlands	CBCL	Yes	Yes	Yes
Goldney et al,[68] 1996	34-233	12-24	12-18	INT	Australia	CBCL	Yes	Yes	Yes
Golombok et al,[69] 2001	49-38	<12	4-12	. . .	United Kingdom	SDQ	NA	NA	Yes

Abbreviations: BASC, Behavior Assessment System for Children; BDC, Behavior Description Chart; BDGHI, Buss-Durkee Guilt-Hostility Inventory; BP, Behavior Profile; BPI, Behavior Problem Index; BSQ, Behavior Style Questionnaire; C, child report; CBCL, Child Behavior CheckList; CES-D, Center for Epidemiologic Studies Depression Scale; CFMAS, Children's Form of the Manifest Anxiety Scale; CTP, California Test of Personality; DIS, Diagnostic Interview Schedule; DISC, Diagnostic Interview Schedule for Children; *DSM-III*, *Diagnostic and Statistical Manual of Mental Disorders, Third Edition*; DSPQ, Developmental and Sensory Processing Questionnaire; HSCL, Hopkins Symptom CheckList; IBQ, Infant Behavior Questionnaire; *ICD-9*; *International Classification of Diseases, Ninth Revision*; INT, sample with 100% international adoptees; NA, data were not reported or not extractable; OARS, Older Adults Resources and Services; Q90, questionnaire on adolescent health habits and risk behavior; QBPC, Quay's Behavior Problems Checklist; P, parent report; Rutter (P), Rutter Parent scale; Rutter (T), Rutter Teacher Scale; SCL-90, Symptoms CheckList; SCR-90-R, Symptoms Distress Checklist-90-Revised; SDI, Survey Diagnostic Instrument (based on *DSM-III*); SDQ, Strengths and Difficulties Questionnaire; T, teacher report; TABS, Temperament and Atypical Behavior Scale; TQ, temperament questionnaire; YSR, Youth Self-Report. Abbreviations apply to Table 1 and Table 2. Ellipses indicate that the sample included predominantly domestic adoptees.

*Based on the scores for externalizing and internalizing problems, a weighted average score was constructed for total problems.

†Norm indicates the percentage of out-of-home placements in a normative population.

RESULTS

We were able to find 101 subsamples (study outcomes or subsamples coded separately, eg, males and females; hereafter, studies) on total behavior problems, including 25 281 cases and 80 260 controls, 64 studies on externalizing problems and 64 studies on internalizing problems (TABLE 1 and TABLE 2[7,13,17,18,20-22,40-96]). We also found 36 studies on mental health referrals (reported in 34 articles; TABLE 3[97-129]), including 5092 cases and 75 858 controls. The studies were published in English, Spanish, German, Dutch, and Swedish. The studies were conducted in North America (54%): Canada and the United States; Europe (33%): Belgium, Finland, France, Germany, Greece, the Netherlands, Norway, Spain, Sweden, the United Kingdom; Australia and New Zealand (11%); and other countries (2%). The majority of participants in the studies coded as noninternational, domestic adoption studies were placed within the country. A few domestic adoption studies included a minority of international adoptees (eg, 23%[43] or 28%[85]).

For total behavior problems, the age at assessment was from 0 to 4 years in 7% of the studies; older than 4 to 12 years in 44.5%; older than 12 to 18 years

Table 2. Case-Control Studies With Behavioral Data*

Source	No. of Adoptees-No. of Nonadopted Controls	Age at Adoption, mo	Age at Assessment, y	Study Population	Country of Study	Type of Diagnostic Tool	Type of Problem Behavior		
							Externalizing	Internalizing	Total
Hjern et al,[18] 2002	11320-2343	<12	12-18	INT	Sweden	*ICD-9*	Yes	Yes	Yes†
Hodges et al,[70] 1989	23-23	>24	12-18	. . .	United Kingdom	Rutter (P/T)	Yes	Yes	Yes
Hoksbergen et al,[71] 2002	80-1172	>24	4-12	INT	The Netherlands	CBCL	Yes	Yes	Yes
Hoopes et al,[72] 1970	100-100	NA	12-18	. . .	United States	CTP (T)	NA	NA	Yes
Hoopes et al,[73] 1997	24-norm‡	12-24	12-18	. . .	United States	CBCL	NA	NA	Yes
Howard et al,[74] 2004	89-87	12-24	4-12	INT	United States	BPI	NA	NA	Yes
Howard et al,[74] 2004	481-88	<12	12-18	. . .	United States	BPI	NA	NA	Yes
Judge,[75] 2003	108-621	>24	0-4	INT	United States	TABS	NA	NA	Yes
Kim et al,[76] 1999	18-9	<12	4-12	INT	United States	CBCL	Yes	Yes	Yes
Lansford et al,[77] 2001	11-200	<12	12-18	. . .	United States	CBCL	Yes	Yes	Yes
Levy-Shiff,[78] 2001	91-91	<12	>18	. . .	Israel	SCR-90-R	NA	NA	Yes
Lindholm and Touliatos,[79] 1980	41-2991	NA	4-12	. . .	United States	QBPC (T)	Yes	Yes	Yes†
Lipman et al,[80] 1992	104-3185	NA	4-12	. . .	Canada	SDI	NA	NA	Yes
Logan et al,[81] 1998	62-601	12-24	4-12	. . .	United Kingdom	CBCL	NA	NA	Yes
Logan et al,[81] 1998	35-600	12-24	4-12	. . .	United Kingdom	CBCL	NA	NA	Yes
Marcovitch et al,[82] 1997	56-norm‡	<12	4-12	INT	Canada	CBCL	NA	NA	Yes
Maughan et al,[83] 1998	121-251	<12	4-12	. . .	United Kingdom	Survey	NA	NA	Yes
Palacios and Sanchez,[13] 1996	210-314	>24	4-12	. . .	Spain	Rutter (T)	Yes	Yes	Yes
Pinderhughes,[84] 1998	33-16	>24	4-12	. . .	United States	CBCL	Yes	Yes	Yes†
Pinderhughes,[84] 1998	33-17	12-24	4-12	. . .	United States	CBCL	Yes	Yes	Yes†
Priel et al,[85] 2000	50-80	12-24	4-12	. . .	Israel	CBCL	Yes	Yes	Yes†
Rojewski et al,[86] 2000	45-norm‡	12-24	0-4	INT	United States	BASC (P)	Yes	Yes	Yes†
Rosenwald,[87] 1994	279-2729	<12	4-12	INT	Australia	CBCL	NA	NA	Yes
Sharma et al,[88] 1996	4464-5443	12-24	12-18	. . .	United States	Survey	Yes	Yes	Yes†
Sharma et al,[89] 1998	881-78	<12	12-18	. . .	United States	YSR	Yes	Yes	Yes
Sharma et al,[89] 1998	92-norm‡	<12	12-18	INT	United States	YSR	Yes	Yes	Yes
Singer et al,[90] 1985	20-10	<12	0-4	. . .	United States	IBQ	NA	NA	Yes
Smyer et al,[91] 1998	60-60	<12	>18	. . .	Sweden	OARS	NA	NA	Yes
Stams et al,[17] 2000	159-norm‡	<12	4-12	INT	The Netherlands	CBCL	Yes	Yes	Yes
Storsbergen,[92] 2004	49-norm‡	<12	>18	INT	The Netherlands	SCL-90	NA	Yes	NA
Sullivan et al,[93] 1995	24-1212	<12	>18	. . .	New Zealand	DIS (*DSM-III*)	Yes	NA	Yes
Tsitsikas et al,[94] 1988	72-72	<12	4-12	. . .	Greece	BSQ	NA	NA	Yes
Verhulst et al,[7] 1990	2148-931	>24	12-18	INT	The Netherlands	CBCL	Yes	Yes	Yes
Warren,[95] 1992	145-3553	NA	12-18	. . .	United States	Interview	NA	NA	Yes
Witmer et al,[96] 1963	484-484	<12	4-12	. . .	United States	BDC (T)	Yes	Yes	Yes†

For abbreviations see footnotes to Table 1.
*Ellipses indicate that the sample included predominantly domestic adoptees.
†Based on the scores for externalizing and internalizing problems a weighted average score was constructed for total problems.
‡Norm indicates the percentage of out-of-home placements in a normative population.

Table 3. Studies With Mental Health Referral Data for Adoptees

Source	No. of Adoptees-No. of Nonadopted Controls	Age at Adoption, mo	Age at Assessment, y	Study Population	Country of Study	Type of Mental Health Referral
Borgatta and Fanshel,[97] 1965	123-2158	NA	NA	. . .	United States	Outpatient psychiatric clinic
Brinich and Brinich,[98] 1982	41-826	<12	4-12	. . .	United States	Psychiatric institute
Cederblad,[99] 1991	84-3916	>24	4-12	INT	Sweden	Child psychiatric clinic
Dery-Alfredsson and Katz,[100] 1986	171-9660	NA	4-12	INT	Sweden	Child psychiatric clinic
Deutsch,[101] 1982*	24-206	NA	4-12	. . .	United States and Canada	Child development or pediatric clinic
Deutsch,[101] 1982*	15-185	NA	4-12	. . .	United States and Canada	Child development or pediatric clinic
Dickson et al,[102] 1990	44-331	12-24	12-18	. . .	United States	Psychiatric hospital inpatient unit
Eiduson and Livermore,[103] 1953	8-72	NA	4-12	. . .	United States	Psychiatric clinic
Goldberg and Wolkind,[104] 1992	200-5600	NA	NA	. . .	United Kingdom	Psychiatric clinic
Goodman et al,[105] 1963	14-579	>24	4-12	. . .	United States	Child psychiatric clinic
Goodman and Magno,[106] 1975	100-2400	NA	NA	. . .	United States	Child psychiatric clinic
Hoksbergen and Bakker-van Zeil,[107] 1983	199-16754	NA	4-12	INT	The Netherlands	Child guidance or psychiatric treatment
Hoksbergen et al,[108] 1988	349-15522	NA	NA	INT	The Netherlands	Out-of-home placements or residential settings
Holden,[109] 1991	18-452	<12	12-18	. . .	United Kingdom	Psychiatric hospital
Holman,[110] 1953	11-189	NA	NA	. . .	United States	Child guidance clinic or residential placement
Howard et al,[74] 2004	89-87	12-24	4-12	INT	United States	Placement in a mental health facility
Howard et al,[74] 2004	481-88	<12	12-18	. . .	United States	Placement in a mental health facility
Humphrey and Ounsted,[111] 1963	80-2679	<12	4-12	. . .	United Kingdom	Psychiatric hosptital
Jameson,[112] 1967	42-348	12-24	NA	. . .	United States	Psychiatric service
Jerome,[113] 1986	128-1699	NA	4-12	. . .	Canada	Treatment in mental health center
Jungmann,[114] 1980	28-2182	12-24	4-12	. . .	Germany	Psychiatric clinic
Kenny et al,[115] 1967	39-961	<12	4-12	. . .	United States	Pediatric clinic
Ketchum,[116] 1964	20-176	<12	4-12	. . .	United States	Psychiatric hospital
Kotsopoulos et al,[117] 1988	9-105	<12	12-18	. . .	Canada	Psychiatric service
Piersma,[118] 1987	134-1102	12-24	12-18	. . .	United States	Inpatient psychiatric treatment
Pringle,[119] 1961	210-2383	NA	NA	. . .	United Kingdom	Out-of-home placement in residential setting
Reece and Levin,[120] 1968	11-233	<12	4-12	. . .	United States	Psychiatric service
Rogeness et al,[121] 1988	66-697	12-24	12-18	. . .	United States	Psychiatric hospital
Schechter,[122] 1960	16-104	NA	NA	. . .	United States	Private psychiatric practice
Senior and Himadi,[123] 1985	34-126	>24	12-18	. . .	United States	Adolescent psychiatric inpatient unit
Simon and Senturia,[124] 1966	35-1330	<12	12-18	. . .	United States	Psychiatric department
Sweeny et al,[125] 1963	21-271	<12	4-12	. . .	United States	Child guidance clinic
Toussieng,[126] 1962	39-318	<12	4-12	. . .	United States	Outpatient psychiatric service
Treffers et al,[127] 1998	45-1907	NA	4-12	INT	The Netherlands	Child psychiatric clinic
Verhulst and Versluis-den-Bieman,[128] 1989	2136-norm†	NA	12-18	INT	The Netherlands	Out-of-home placement in residential setting
Zucker and Bradley,[129] 1998	28-210	12-24	4-12	. . .	Canada	Psychiatric referral

Abreviations: INT, sample with 100% international adoptees; NA, data were not reported or not extractable; ellipses, sample included predominantly domestic adoptees.
*Figures are from 2 clinics.
†Norm indicates the percentage of out-of-home placements in a normative population.

in 44.5%; and more than 18 years in 4%. Age at adoptive placement was from 0 to 12 months in 45% of the studies; more than 12 to 24 months in 21%; more than 24 months in 24%; and not reported in 10%. Separate data were reported for male and female adoptees in 24% of the studies and in 52% of the studies data for mixed groups were reported. The nonadopted control groups consisted of samples from the general population (50% of the studies), classmates (12%), siblings of the adoptees (6%), and norm groups, eg, Child Behavior Checklist norms (32%).

For mental health referrals, age at assessment was from 4 to 12 years in 53% of the studies; older than 12 to 18 years in 25%; and not reported in 22%. Age at adoptive placement was from 0 to 12 months in 31% of the studies; more than 12 to 24 months in 19%; more than 24 months in 8%; and not reported in 42%. Distinct data for female and male adoptees were not reported. The nonadopted control groups consisted of samples from the general population (8%) and normative data (92%).

Adoptees vs Nonadopted Controls

Analyzing all adoption studies, we computed effect sizes (*d*)[32] for the overall differences between adoptees (both within and between countries) and nonadopted controls (TABLE 4). Compared with nonadopted controls, adoptees showed more total behavior problems (*d*, 0.18; 95% CI, 0.13-0.24), more externalizing behavior problems (*d*, 0.24; 95% CI, 0.16-0.31), and more internalizing behavior problems (*d*, 0.16; 95% CI, 0.07-0.26), all in heterogeneous sets of studies, but all effect sizes were small.[32] Also, adoptees were overrepresented in mental health referrals (*d*, 0.72; 95% CI, 0.57-0.86) in a heterogeneous set of studies, and this effect size was large. No publication bias was found in these 4 meta-analyses (*Lo*, 0 in all cases). The fail-safe number was $k = 5251$ for total problems, $k = 3128$ for externalizing problems, $k = 2758$ for internalizing problems, and $k = 7282$ for mental health referrals. Combined effect sizes and CIs computed with the jackknife procedure remained the same for all 4 meta-analyses.

International Adoptees vs Nonadopted Controls

There were 47 studies involving international adoptees reporting on total behavior problems, 29 studies on externalizing problems, 30 studies on internalizing problems (TABLE 5), and 7 studies reporting on mental health referrals (Table 4). The adopted children came from Romania or Russia,[20,21,59,71,75,82] Korea (and other countries),[40,44,49,76,87,89] India (and other countries),[22,45,65] Colombia (and other countries),[57] Thailand,[67] Indonesia,[68] China,[86] Sri Lanka (and other countries),[17] Greece,[92] and several countries in Asia and South America.[7,18,41,74]

Compared with nonadopted controls, international adoptees showed more total behavior problems (*d*, 0.11; FIGURE 1). Combined effect size and CIs computed with the jackknife procedure remained the same. With the trim-and-fill procedure, a publication bias was found in this meta-analysis (*Lo*, 13), resulting in an adjusted effect of *d*, 0.06 (95% CI, 0.04-0.09). The fail-safe number was $k = 577$. Compared with non-

Table 4. Meta-analytic Results of Studies Comparing Behavior Problems and Mental Health Referrals of Adoptees and Nonadopted Controls

	No. of Adoptees-No. of Nonadopted Controls	*k*	Effect Size, *d* (CI)*	*Q*
Total behavior problems				
Total set	25 281-80 260	101	0.18 (0.13-0.24)†‡	543.91§
Adoption type				
International	15 790-30 450	47	0.11 (0.09-0.13)‖¶	61.85
Domestic	9491-49 810	54	0.20 (0.14-0.27)†¶	331.05§
Externalizing problems				
Total set	22 456-47 723	64	0.24 (0.16-0.31)†‡	367.65§
Adoption type				
International	14 581-17 363	29	0.10 (0.08-0.13)‖¶	28.55
Domestic	7875-30 360	35	0.34 (0.26-0.42)†¶	211.75§
Internalizing problems				
Total set	22 483-52 579	64	0.16 (0.07-0.26)†‡	698.08§
Adoption type				
International	14 596-18 322	30	0.07 (0.05-0.10)‖¶	22.55
Domestic	7887-34 257	34	0.23 (0.13-0.32)†¶	352.62§
Mental health referrals				
Total set	5092-75 858	36	0.72 (0.57-0.86)†‡	405.38§
Adoption type				
International	3073-47 848	7	0.37 (0.22-0.52)†¶	42.53§
Domestic	2019-28 010	29	0.81 (0.67-0.94)†¶	321.55§

*All effect sizes were statistically significant ($P<.001$). The effect sizes and confidence intervals (CIs) are approximations.
†Random effect.
‡95% CI.
§$P<001$.
‖Fixed effect.
¶85% CI.

Table 5. Meta-analytic Results of Studies Comparing Behavior Problems of International Adoptees and Nonadopted Controls

	No. of Adoptees-No. of Nonadopted Controls	*k*	Effect Size, *d* (CI)*	*Q*
Total Behavior Problems				
Total set	15 790-30 450	47	0.11 (0.09 to 0.13)†‡	61.85
Preadoption adversity				
No	13 175-24 865	29	0.09 (0.05 to 0.12)†‡	35.97
Yes	2615-5585	18	0.18 (0.12 to 0.24)†‡	21.04
Sex of cohort				
Male	5806-11 090	17	0.13 (0.08 to 0.18)†‡	20.42
Female	8810-10 711	17	0.09 (0.05 to 0.14)†‡	11.94
Mixed	1174-8649	13	0.19 (0.05 to 0.32)§¶	29.80‡
Age at adoption, mo				
0-12	12 455-16 937	20	0.09 (0.06 to 0.13)†‡	26.79
>12-24	863-8203	11	0.21 (0.04 to 0.37)‖¶	25.23‡
>24	2472-5310	16	0.16 (0.10 to 0.23)†‡	8.17
Age at assessment, y				
0-4	208-669	4	0.20 (0.02 to 0.38)‡¶	1.07
>4-12	1379-6510	16	0.23 (0.16 to 0.30)†‡	23.43
>12-18	13 819-16 382	26	0.09 (0.05 to 0.12)†‡	20.11
>18	384-6889	1	0.00 (–0.10 to 0.10)	
Time in family, y				
0-4	337-941	6	0.29 (0.03 to 0.54)†¶	12.07‖
>4-8	565-5831	11	0.25 (0.17 to 0.34)†‡	6.35
>8-12	2452-2765	13	0.18 (0.11 to 0.25)†‡	9.88
>12	12 436-20 913	17	0.05 (0.02 to 0.09)‡§	8.96
Control group				
Total No. in norm group	14 593-20 146	21	0.13 (0.07 to 0.20)†‖	42.45‡
General population	2928-17 487	14	0.16 (0.05 to 0.26)§‖	33.61‡
Classmates	327-307	4	0.20 (0.05 to 0.36)‡¶	3.01
Unrelated siblings	11 338-2352	3	0.06 (0.01 to 0.10)‡¶	0.31
Norm group	1197-10304	26	0.18 (0.12 to 0.25)†‡	14.49
Country of study				
North America	626-1132	12	0.23 (0.12 to 0.35)†‡	16.08
Other countries	15 164-29 318	35	0.10 (0.07 to 0.13)†‡	42.70
Publication outlet				
Journal articles	14 852-16 894	29	0.16 (0.10 to 0.22)‡‖	52.04‡
Reports, books	938-13 556	18	0.11 (0.04 to 0.18)‡§	11.42

(continued)

adopted controls, international adoptees presented more externalizing problems (*d*, 0.10; 95% CI, 0.07-0.13) in a homogeneous set of studies. The jackknife procedure yielded a similar point estimate and the same CIs. With the trim-and-fill procedure, 3 studies were trimmed and replaced (*Lo*, 3), resulting in an adjusted effect of 0.09 (95% CI, 0.05-0.12). The fail-safe number was $k = 162$. International adoptees presented more internalizing problems (*d*, 0.07; 95% CI, 0.04-0.11) in a homogeneous set of studies. The jackknife procedure produced the same combined effect size and CIs. No publication bias was found (*Lo*, 0), and the fail-safe number was $k = 84$. For behavior problems, all effect sizes were small.[32]

Finally, international adoptees were overrepresented in mental health referrals (*d*, 0.37; FIGURE 2) and this effect size was medium. The jackknife procedure produced the same combined effect size and CIs. No publication bias was found (*Lo*, 0) and the fail-safe number was $k = 195$. The 7 studies in this meta-analysis reported on serious problems (Table 3): 4 studies found that international adoptees were more often receiving psychiatric treatment[107] in a clinic[99,100,127] than nonadopted children, and 3 studies found that international adoptees were placed out of the home into a residential setting[108,128] or mental health facility[74] more often than nonadopted controls.

International vs Domestic Adoptees

We examined whether international adoptees are at higher risk for behavior problems and clinical referrals than domestic adoptees (Table 4). As several subsets of studies in this meta-analysis were heterogeneous, we present the 85% CIs to test the significance of moderators. No publication bias was present in the meta-analyses of international adoptees vs domestic adoptees (*Lo* = 0 for total behavior problems [fail-safe, $k = 2268$], for externalizing [fail-safe, $k = 1745$], and for internalizing problems [fail-safe, $k = 1768$]). Preliminary analyses showed no differences for sex and age at adoptive placement; therefore, all analyses were conducted without these covariates. However, the sets of international and domestic adoption studies differed in the number of studies that reported evidence of extreme adversity before adoptive placement. Preadoption adversity was described more often in international adoption studies (18 of 21 studies of total behavior problems, 7 of 8 studies of externalizing and internalizing problems, and a single study of mental health referrals).

Contrary to our expectations, we found that international adoptees showed significantly fewer total behavior problems compared with domestic adoptees, for the 85% CIs of the subsets were not overlapping (*d*, 0.11; 85% CI, 0.09-0.13 vs *d*, 0.20; 85% CI, 0.14-0.27, respectively; Table 4). Also, international adoptees showed significantly fewer externalizing problems than domestic adoptees (*d*, 0.10; 85% CI, 0.08-0.13 vs *d*, 0.34; 85% CI, 0.26-0.42, respectively) and also significantly fewer internalizing problems (*d*, 0.07; 85% CI, 0.05-0.10 vs *d*, 0.23; 85% CI, 0.13-0.32, respectively). Because all international adoption studies were conducted after 1990, we repeated the same analyses including only the do-

mestic adoption studies conducted after 1990. Again, international adoptees showed significantly fewer total behavior problems than domestic adoptees (*d*, 0.11; 85% CI, 0.09-0.13; *k*, 47 vs *d*, 0.22; 85% CI, 0.14-0.29; *k*, 40, respectively), fewer externalizing problems (*d*, 0.10; 85% CI, 0.08-0.13; *k*, 29 vs *d*, 0.30; 85% CI, 0.20-0.39; *k*, 25, respectively), and fewer internalizing problems (*d*, 0.07; 85% CI, 0.05-0.10; *k,* 30 vs *d*, 0.27; 85% CI, 0.16-0.37; *k*, 24, respectively).

International adoptees were significantly less often referred to mental health services compared with domestic adoptees (*d*, 0.37; 85% CI, 0.22-0.52 vs *d*, 0.81; 85% CI, 0.67- 0.94; respectively; Table 4). However, the set of pertinent studies involving international adoptees in mental health referrals was small (*k*=7). Because all international adoption studies were conducted after 1980, we repeated the same analysis including only the domestic adoption studies conducted after 1980. Again, international adoptees were significantly less often referred to mental health services than domestic adoptees (*d*, 0.37; 85% CI, 0.22-0.52; *k*, 7 vs *d*, 0.78; 85% CI, 0.57-1.00; *k* = 14; respectively).

Table 5. Meta-analytic Results of Studies Comparing Behavior Problems of International Adoptees and Nonadopted Controls (cont)

	No. of Adoptees-No. of Nonadopted Controls	*k*	Effect Size, *d* (CI)*	*Q*
Externalizing Problems				
Total Set	14 581-17 363	29	0.10 (0.07 to 0.13)†‡	28.55
Sample characteristics				
Preadoption adversity				
No	12 319-15 237	22	0.08 (0.04 to 0.12)†‡	19.34
Yes	2262-2126	7	0.17 (0.10 to 0.24)†‡	4.63
Sex				
Male	5628-8489	10	0.12 (0.07 to 0.17)†‡	15.02
Female	8455-8045	10	0.08 (0.03 to 0.13)‡§	3.87
Mixed	498-829	9	0.11 (–0.01 to 0.23)‡	8.44
Age at adoption, mo				
0-12	12 116-14 170	15	0.08 (0.04 to 0.12)†‡	17.08
>12-24	217-1070	7	0.08 (–0.09 to 0.26)‡	2.97
>24	2248-2123	7	0.17 (0.09 to 0.24)†‡	4.33
Age at assessment, y				
0-4	100-48	3	0.24 (–0.14 to 0.63)‡	0.21
>4-12	877-2679	8	0.17 (0.07 to 0.26)†‡	8.41
>12-18	13 604-14 636	18	0.09 (0.05 to 0.13)†‡	17.02
>18	NA	NA	NA	NA
Time in family, y				
0-4	100-48	3	0.24 (–0.14 to 0.63)‡	0.21
>4-8	247-2310	5	0.26 (0.13 to 0.39)†‡	4.01
>8-12	2182-981	5	0.15 (0.08 to 0.23)†‡	4.52
>12	12 052-14 024	16	0.07 (0.02 to 0.11)†‡	9.45
Design				
Control group				
Total No. in norm group	13 947-13 013	17	0.09 (0.05 to 0.13)†‡	18.32
General population	2382-10 438	11	0.14 (0.07 to 0.21)†‡	7.66
Classmates	227-223	3	0.20 (0.01 to 0.39)‡¶	4.26
Unrelated siblings	11 338-2352	3	0.06 (0.02 to 0.11)‡§	1.26
Norm group	634-4350	12	0.17 (0.07 to 0.26)*†	7.95
Country of study				
North America	230-81	7	0.13 (–0.16 to 0.42)‡	2.10
Other countries	14 351-17 282	22	0.10 (0.07 to 0.13)†‡	26.42
Publication outlet				
Journal articles	14 392-15 779	23	0.10 (0.06 to 0.13)†‡	27.72
Reports, books	189-1.584	6	0.12 (–0.04 to 0.27)‡	0.79

(continued)

International Adoption

Moderator Analyses. For behavior problems, we present fixed models with 95% CIs for the homogeneous set of studies involving international adoptees (Table 5); the *Q* statistic was used to test contrasts. The set of international adoption studies for mental health referrals was too small (*k*=7) to permit moderator analyses.

Sample Characteristics. The following sample characteristics were tested: preadoption adversity, sex, age at adoptive placement, age at assessment, and length of time in the family (Table 5). In 6 out of 9 articles reporting preadoption adversity, children had been adopted from Romanian or Russian orphanages.[20,21,59,71,75,82] International adoptees with preadoption adversity showed more total behavior problems than international adoptees without such backgrounds (*d*, 0.18 vs *d,* 0.09, respectively; Table 5; contrast: Q_1=6.46; *P* = .01) and more externalizing problems (*d*, 0.17 vs *d*, 0.08; respectively; Q_1 = 4.58; *P* = .03). There was no difference in internalizing problem behavior between international adoptees with and without preadoption adversity (Q_1 = 0.30; *P* = .58).

We found no significant differences between male and female international adoptees for total behavior problems (Q_1 = 1.30; *P* = .25), externalizing problems (Q_1 = 1.20; *P* = .27), or internalizing problems (Q_1 = 0.66; *P*=.41).

For children adopted as infants (0-12 months) compared with children adopted after their first birthday, there were no differences for total behavior problems (Q_1 = 2.27; *P* = .13), externalizing problems (Q_1 = 3.44; *P* = .06), or internalizing problems (Q_1 = 0.23; *P* = .63; Table 5). Examining children adopted before or after 24 months resulted in similar, nonsignificant outcomes.

As the category of adulthood (>18 years) consisted of only 1 to 2 studies (Table 5), we restricted the analyses of age at assessment to adolescence (12-18 years) vs early and middle childhood (0-12 years). Contrary to our expectations, we found that international

Table 5. Meta-analytic Results of Studies Comparing Behavior Problems of International Adoptees and Nonadopted Controls (cont)

	No. of Adoptees-No. of Nonadopted Controls	*k*	Effect Size, *d* (CI)*	*Q*
Internalizing Problems				
Total Set	14 596-18 322	30	0.07 (0.04 to 0.11)†‡	22.55
Sample characteristics				
Preadoption adversity				
No	12 334-16 196	23	0.07 (0.03 to 0.11)†‡	18.57
Yes	2262-2126	7	0.09 (0.02 to 0.16)‡¶	3.68
Sex				
Male	5655-8921	11	0.08 (0.03 to 0.13)†‡	11.38
Female	8477-8622	11	0.05 (0.00 to 0.10)‡¶	2.35
Mixed	464-779	8	0.13 (0.00 to 0.26)‡¶	7.34
Age at adoption, mo				
0-12	12 165-15 179	17	0.07 (0.03 to 0.11)†‡	16.88
>12-24	183-1020	6	0.13 (–0.06 to 0.32)‡	2.75
>24	2248-2123	7	0.08 (0.01 to 0.15)‡¶	2.47
Age at assessment, y				
0-4	100-48	3	0.38 (0.00 to 0.76)‡	0.34
>4-12	843-2629	7	0.12 (0.01 to 0.24)‡¶	7.96
>12-18	13 604-14 636	18	0.06 (0.03 to 0.10)†‡	10.35
>18	49-1009	2	0.12 (–0.16 to 0.41)‡	0.07
Time in family, y				
0-4	100-48	3	0.38 (0.00 to 0.76)	0.34
>4-8	247-2310	5	0.17 (0.04 to 0.31)‡¶	6.75
>8-12	2148-931	4	0.09 (0.02 to 0.17)‡¶	1.31
>12	12 101-15 033	18	0.06 (0.02 to 0.10)‡§	8.52
Design				
Control group				
Total No. in norm group	13 913-12 963	16	0.07 (0.03 to 0.10)†‡	11.92
General population	2382-10 438	11	0.08 (0.01 to 0.14)‡¶	6.96
Classmates	193-173	2	0.25 (0.05 to 0.46)‡	1.14
Unrelated siblings	11 338-2352	3	0.05 (0.01 to 0.10)‡	0.16
Norm group	683-5359	14	0.12 (0.03 to 0.21)‡§	9.33
Country of study				
North America	230-81	7	0.18 (–0.11 to 0.47)‡	3.01
Other countries	14 366-18 241	23	0.07 (0.04 to 0.11)†‡	19.03
Publication outlet				
Journal articles	14 392-15 779	23	0.07 (0.04 to 0.11)†‡	20.95
Reports, books	204-2543	7	0.11 (–0.03 to 0.26)‡	1.29

Abbreviation: NA, no studies were available.
*The effect size and confidence intervals (CIs) are approximations.
†$P<.001$.
‡Fixed effects.
§$P<.01$.
||Random effects.
¶$P<.05$.

adoptees presented fewer total behavior problems in adolescence compared with international adoptees in early and middle childhood (*d*, 0.09 vs *d*, 0.23; respectively; $Q_1 = 13.89$; $P < .001$). Externalizing problems did not differ for adolescence vs early and middle childhood (*d*, 0.09 vs *d*, 0.17; respectively; $Q_1 = 2.76$; $P = .10$), nor did internalizing problems (*d*, 0.06 vs *d*, 0.14; respectively; $Q_1 = 2.04$; $P = .15$).

Children who had been with their adoptive family for more than 12 years showed fewer total behavior problems than children who had been with the family for less than 12 years (*d*, 0.05 vs *d*, 0.21; respectively; $Q_1 = 24.07$; $P < .001$) and fewer externalizing problems (*d*, 0.07 vs *d*, 0.18; respectively; $Q_1 = 8.52$; $P = .003$). For internalizing problems, the contrast was not significant (*d*, 0.06 vs *d*, 0.12; respectively; $Q_1 = 2.82$; $P = .09$).

Design. Studies that made use of a norm group as a comparison group for the international adoptees did not differ from studies that used a general population sample, classmates, or siblings (Table 5). For total behavior problems, one of the subsets was heterogeneous (studies not using a norm group) so the 85% CIs were inspected to test for significance. Because the CIs were overlapping (norm group, *d*, 0.18; 85% CI, 0.14-0.23 vs no norm group, *d*, 0.13; 85% CI, 0.08-0.18), there was no difference between the 2 subsets. For externalizing and internalizing problems, the 2 subsets were homogeneous and these contrasts were tested with the *Q* statistic. There was no significant difference between studies using norm groups or other control groups for externalizing problems ($Q_1 = 2.28$; $P = .13$) or internalizing problems ($Q_1 = 1.30$; $P = .25$).

Country of study was a significant moderator (Table 5). Studies conducted in North America reported more total behavior problems for international adoptees than studies outside North America (*d*, 0.23 vs *d*, 0.10; respectively; $Q_1 = 4.69$; $P = .03$). Studies in and outside North America did not differ with respect to externalizing problems ($Q_1 = 0.04$; $P = .85$) or internalizing problems ($Q_1 = 0.50$; $P = .48$).

Publication Outlet. We examined the 85% CIs as one of the subsets for total problems was heterogeneous. Confidence intervals of both subsets were overlapping: journal articles (*d*, 0.16; 85% CI, 0.11-0.20) did not differ from other outlets (*d*, 0.11; 85% CI; 0.06-0.16). The contrasts for externalizing problems ($Q_1 = 0.04$; $P = .84$) and internalizing problems ($Q_1 = 0.31$; $P = .58$) also showed that journal articles did not differ from other outlets.

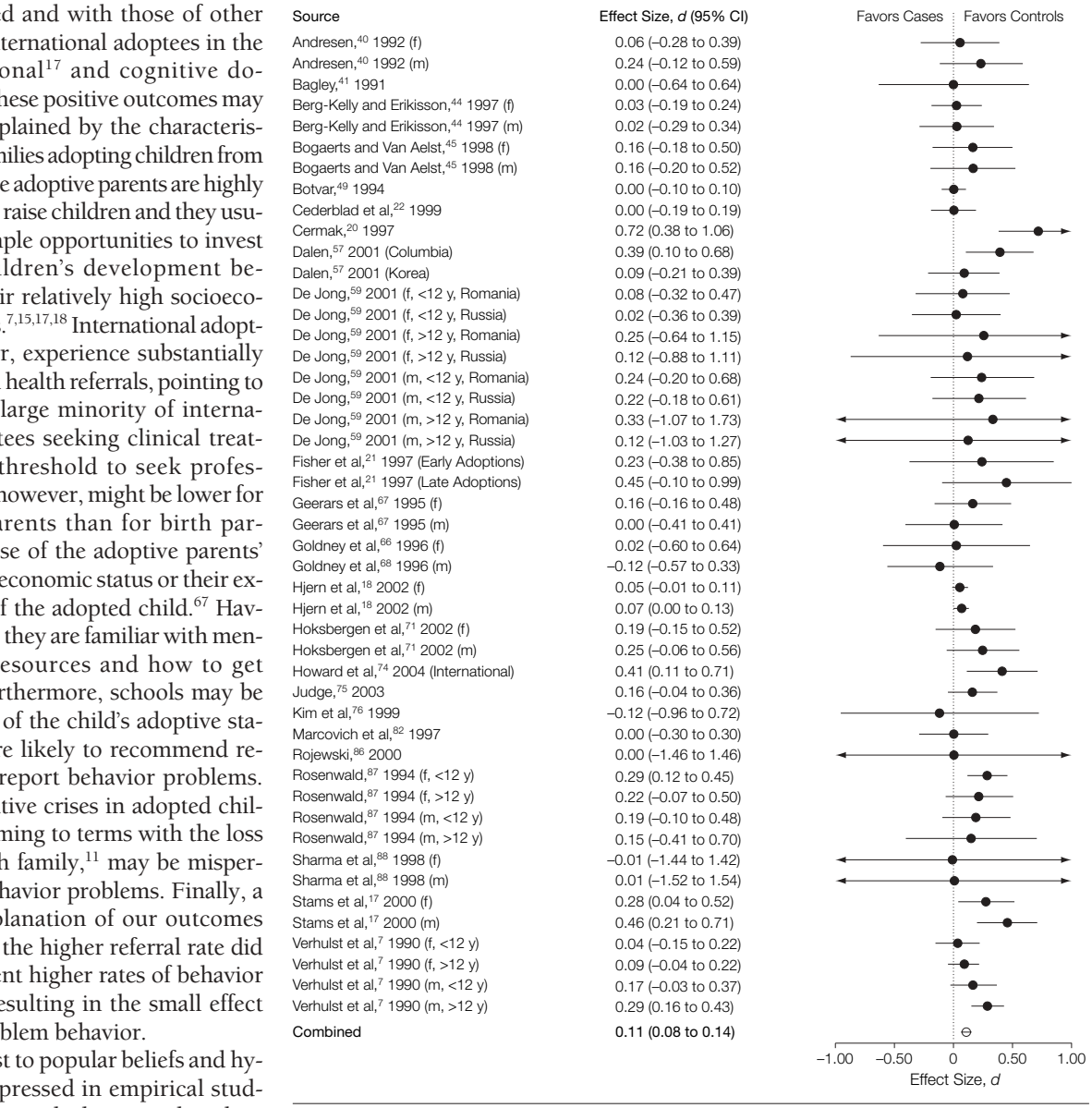
COMMENT

As expected from their less optimal start in life, international adoptees presented with more total, externalizing, and internalizing behavior problems than their nonadopted peers and are overrepresented in mental health services. However, the rate of behavior problems is modest, indicating that most international adoptees are well-adjusted. These findings converge with those of a large

Swedish cohort study[18] that found that the majority of international adoptees are well-adjusted and with those of other studies of international adoptees in the socioemotional[17] and cognitive domains.[14,15] These positive outcomes may be partly explained by the characteristics of the families adopting children from abroad. These adoptive parents are highly motivated to raise children and they usually have ample opportunities to invest in their children's development because of their relatively high socioeconomic status.[7,15,17,18] International adoptees, however, experience substantially more mental health referrals, pointing to a relatively large minority of international adoptees seeking clinical treatment. The threshold to seek professional help, however, might be lower for adoptive parents than for birth parents[95] because of the adoptive parents' higher socioeconomic status or their expectations of the adopted child.[67] Having adopted, they are familiar with mental health resources and how to get services. Furthermore, schools may be more aware of the child's adoptive status and more likely to recommend referral or to report behavior problems. Also, normative crises in adopted children, eg, coming to terms with the loss of their birth family,[11] may be misperceived as behavior problems. Finally, a positive explanation of our outcomes may be that the higher referral rate did in fact prevent higher rates of behavior problems, resulting in the small effect sizes for problem behavior.

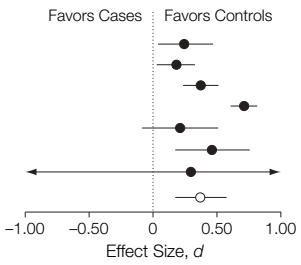
In contrast to popular beliefs and hypotheses expressed in empirical studies,[18] international adoptions show better behavioral and mental health outcomes than domestic adoptions. Our findings indicate that this is not explained by lower rates of preadoption adversity experienced by the international adoptees compared with domestic adoptees, as evidence of preadoption malnutrition, neglect, or abuse was reported more often in the international adoption studies. It is possible that in many transracial international adoptions, physical differences between parents and children are so obvious that the fact of the adoption was never a secret, resulting in more communication and trust in the family. Families choosing international (transracial) adoption may have different parenting qualities compared with parents in more traditional adoptions. No systematic information about parenting abilities is available in our data set. However, in most countries parents undergo a screening procedure to assess their potential fitness for parenting and receive (some) preparation. Finally, genetic risks may differ between international and domestic adoption. Whereas children in international adoption are often adopted because of lack of resources and poverty,[1] relinquishment in domestic adoption may (also) involve mental health problems in the

Figure 1. Meta-analysis of Total Behavior Problems in International Adoptees



Error bars represent 95% confidence intervals (CIs); f, female; m, male. Including 15 790 international adoptees and 30 450 nonadopted controls, international adoptees showed more total behavior problems (*d*, 0.11; $P<.001$; 95% CI, 0.08-0.14; *k*, 47) in a homogeneous set of studies (*Q*, 61.85; $P=.06$).

Figure 2. Meta-analysis of Mental Health Referrals in International Adoptees



Error bars represent 95% confidence intervals (CIs). Including 3073 international adoptees and 47 848 nonadopted controls, international adoptees were overrepresented in mental health referrals (*d*, 0.37; $P<.001$; 95% CI, 0.17-0.57; $k = 7$) in a heterogeneous set of studies (Q, 42.53; $P<.001$).

birth parent,[74] such as substance abuse or psychiatric disorders. Although reasons for relinquishment may overlap, genetic risks predisposing for mental health problems may be less prevalent in international adoptees.

The relatively positive outcomes of international adoption do not imply that international adoption should be preferred to domestic adoption in the sending countries. In our meta-analyses, domestic adoptions in developing countries could not be included due to the lack of empirical studies.

Our meta-analytic outcomes confirm the hypothesized greater risk for internationally adopted children with backgrounds of extreme deprivation, neglect, malnutrition, or abuse. Clinicians and mental health professionals should be aware of this risk and support adoptive parents with preventive or therapeutic help.

In contrast to some evidence,[7,17] internationally adopted males do not present more behavior problems than internationally adopted females. Furthermore, we did not find convincing evidence that age at adoptive placement is a decisive factor for international adoptees' behavior problems. Contrary to previous research,[7,130] we found that international adoptees showed fewer total behavior problems in adolescence compared with international adoptees in early and middle childhood. Although it might be true in general that adoptees are questioning their identity more intensively in adolescence,[11,130] international adoptees may begin struggling with identity issues much earlier because racial and cultural differences between adoptive parents and adoptees are more obvious than in domestic adoption. Some behavior problems in adoptees may occur on a different time schedule than in nonadopted children. For example, identity issues may surface earlier in adoptees than in their nonadopted peers. Therefore, mental health professionals should be aware of increased rates of behavior problems in families with international adoptees during the years before adolescence. We also found that children who had been with the adoptive family for more than 12 years showed fewer total and externalizing behavior problems than children who had been in the family for less than 12 years. This may indicate that a longer stay in the adoptive family offers children opportunities to recover from their problem behavior. Finally, we found more total behavior problems in studies conducted in North America. On the basis of our data base, we are unable to suggest explanations for this finding. Future research should examine this issue.

Limitations of our series of meta-analyses are, first, the small number of studies of international adoptees with mental health referrals. More studies are needed to consolidate these findings. However, the meta-analytic findings on the behavioral outcomes of international adoptees converge with the mental health referral findings. The small number of studies on mental health referrals of international adoptees also precluded moderator analyses. A second limitation is that our definitions of international and domestic adoption and preadoption adversity may have introduced bias, as in some domestic adoption studies a minority of international adoptees were included and in samples without adversity some adoptees may have been neglected or abused. However, if such bias had been present, it would have resulted in an underestimation of our effects. Based on the positive outcomes for international adoptees and the negative outcomes for preadoption adversity, even larger differences in favor of international adoptees without preadoption adversity may be expected in totally unbiased samples. A third limitation is that we used only the first assessment of longitudinal adoption studies, possibly resulting in a bias toward fewer behavior problems. However, we know of only 1 study[7,130] for which this would apply, restricting the possibility of such a bias to a minimum. A fourth limitation is that our findings may not generalize to the large group of Chinese children adopted in the United States, Canada, and Europe in recent years because their development has not been studied well yet (with one exception[86]). A fifth limitation is that we were unable to compare the international adoptees and nonadopted controls on demographic background variables although in most studies it was reported that adoptive parents were somewhat older and more highly educated than the parents of the controls.[7,17,18,60,71,74,75] It is unknown how the demographics would affect the outcomes of our meta-analysis. A final limitation is that we only included studies with nonadopted control groups, thus excluding articles comparing international adoptees with other comparison groups, such as children in foster care or children remaining in institutions. In a meta-analysis of adopted children's cognitive development, we found that adopted children outperformed their peers and siblings who remained in the children's home or birth family.[14] In the current meta-analysis, such a comparison was not possible be-

cause there were no studies available addressing this issue. For future studies, it is important to compare internationally adopted children not only with nonadopted controls but also with these other relevant groups.

In sum, our series of meta-analyses showed that the majority of international adoptees are well-adjusted although more adoptees are referred to mental health services compared with nonadopted controls. Contrary to common opinion, international adoptees present fewer behavior problems than domestic adoptees, and they have lower rates of mental health referral. Unexpectedly, age at adoption does not appear to be important for the development of behavioral problems. International adoptees with backgrounds of extreme adversity are at risk for more behavior problems, in particular externalizing problems, compared with international adoptees without preadoption adversity. Clinicians should be aware of higher risks for problem behaviors in domestic adoptees and in international adoptees who experienced neglect or maltreatment in the preadoptive period.

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Study concept and design: Juffer, van IJzendoorn.
Acquisition of data: Juffer.
Analysis and interpretation of data: Juffer, van IJzendoorn.
Drafting of the manuscript: Juffer, van IJzendoorn.
Critical revision of the manuscript for important intellectual content: Juffer, van IJzendoorn.
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Every age has a language of its own; and the difference in the words is often far greater than in the thoughts. The main employment of authors, in their collective capacity, is to translate the thoughts of other ages into the language of their own.
—Augustus Hare (1834-1903)