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MENTAL HEALTH IN DANISH DOMESTIC AND INTERNATIONAL ADOPTEES AS YOUNG ADULTS

VIVE – DANISH CENTRE OF APPLIED SOCIAL SCIENCE

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VIVE Working Paper:

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Abstract

This study examines psychiatric contacts and a range of psychiatric disorders among domestic and international adoptees in Denmark using register data on all non-kin adoptees from the birth cohorts of 1989–1994 (N=3.180) and their non-adopted peers (N=418,272). The odds of an adoptee having a psychiatric contact before the age of 20 is more than double that of their non-adopted peers, and adoptees also have higher rates of psychiatric disorders. Moreover, this study demonstrates considerable heterogeneity among non-kin adoptees in terms of their likelihood to have psychiatric contact.

Keywords: non-kin adoption, international adoption, mental illness, psychopathology, psychiatric contact, young adults

Studies from many countries report that adopted children and adolescents are more often referred to mental health services than their non-adopted peers, and that adoptees are more often diagnosed with psychiatric illnesses (Behle & Pinquart, 2016; e.g. Dekker et al., 2016; Juffer & van IJzendoorn, 2005; Laubjerg, Christensen, & Petersson, 2009; Lindblad, Hjern, & Vinnerljung, 2003). Moreover, some of these studies suggest that country of origin and age at adoption are associated with increased mental health risk: the older the child is at adoption, the higher their risk

of mental health problems (Behle & Pinquart, 2016; Hjern, Lindblad, & Vinnerljung, 2002; Odenstad et al., 2008).[1] However, even though there are studies examining the geographic origins of adoptees, thus far there is a lack of research analysing the associations between their specific countries of origin and their risk of psychiatric contacts and psychiatric diagnoses.

This study seeks to fill this gap in the literature by analysing the association between non-kin adoptees' countries of origin and their likelihood of being diagnosed with a range of psychiatric illnesses. The analysis focuses on non-kin adoptees, i.e. those who do not have kinship or other biological ties to their adoptive parents, and of whom the majority were born outside of Denmark. Many studies have shown that non-kin adoptees, in particular, face certain issues relating to their adoption. For instance, they often face adversity before they move to a better environment, they have to cope with the loss of their birth family and/or they may experience (many) shifts in their care environment and changes to their primary caregiver(s) before they are adopted (Miller, 2005; Tirella et al., 2008). Moreover, growing up, many non-kin adoptees face questions regarding their identity. In Western societies, non-kin adoptees from non-Western countries may also experience discrimination simply because their physical appearance differs from that of the majority population (Juffer, Tieman, & Juffer, 2009; Koskinen, 2015; Koskinen et al., 2015; Tigervall & Hübinette, 2010). Furthermore, if their birthparents have a higher prevalence of psychiatric disorders with genetic components, then it follows that adopted children will, on average, also be at a higher risk of experiencing psychiatric disorders (Behle & Pinquart, 2016; Klahr et al., 2017; Wicks, Hjern, & Dalman, 2010). All of these circumstances – both before and after the adoption – are reasons to hypothesize that non-kin adoptees are at risk of developing psychiatric disorders. Still, at the same time the adoption can also be considered a successful positive intervention that ameliorates these

[1] Though there is not agreement about which age thresholds that are decisive.

circumstances (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2005; van IJzendoorn & Juffer, 2005).

Bowlby (1988) described the development of a young child as a set of railroad tracks that can travel in all directions. Accessible parents give the child access to all developmental options, because secure children develop a basic trust in their caregivers that gives them confidence and the ability to socially participate in and explore the world around them. In contrast, a child who has inaccessible parents (and thus an insecure attachment) has very few options, and is at risk of experiencing a less-favourable development. From this perspective, psychopathological behaviour can be seen as the result of a lack of options (Jørgensen, 2003; Rechenbach, 2003). According to attachment theory, psychopathology is not a regressive condition. Rather, attachment theory considers mental illness the result of concrete events that took place during childhood, and views loss and trauma as particularly significant. Psychopathology in adulthood is therefore often caused by a pathological mourning reaction, or faulty development due to experiencing unqualified care and loss in childhood. Such experiences will be common in the case of non-kin adoptees, but Bowlby's theoretical hypothesis that corrective attachment experiences may compensate for early deprivation, in particular during the first five years of the child's life (Bowlby, 1988; Rechenbach, 2003), is also applicable to adoption research.

Thus, adoption both implies risks (deprivation before placement) and protection (the care and stimulation received from adoptive parents). These factors are relevant to adoption research because the accumulation of risk factors leads to less-than-optimal child development, whilst the protective factors may ameliorate the negative effects of the risks (Rutter, 1990; Werner, 2000). Drawing on attachment theory and taking a risk and resilience perspective, the theoretical point of departure for this paper is that adoption is a risk factor for developing psychiatric disorders in young adulthood.

Even though the data used in this paper does not allow me to directly test the link between psychiatric disorders and the quality of an adoptee's early attachment, the analysis provides new evidence about the risk of psychiatric contacts and a range of psychiatric diagnoses of non-kin adoptees, as compared to non-adoptees at age 20. Moreover, it also provides new insights into the impact of country of origin on risk for these psychiatric outcomes among the non-kin adoptee group in Denmark.

Does Country of Origin Matter for the Mental Health of Adoptees?

There are important structural differences between the countries of origin of adoptees, such as their GDP, the quality of their health and social services and their general living conditions, which might affect the health of pregnant mothers and their children in utero (Dickens, 2009; Miller, 2005). Furthermore, countries' adoption procedures also differ, particularly in terms of the quality of their orphanages and/or the foster families with whom the children reside before being adopted (Miller, 2005; Odenstad et al., 2008). Many adoption scholars emphasize the South Korean example, because the reasons for adoption and the adoption procedure in South Korea – at least in the 1970s and 1980s – held a special position in international adoption. Many of the children given up for adoption in South Korea in this period were born out of wedlock, which is likely to be less consequential for the child when compared to other reasons for giving a child up for adoption, such as psychiatric illness, poverty and drug or alcohol abuse (all things being equal). Moreover, most South Korean children live in loving, attentive foster care prior to their adoptive placement (Bergquist, Vonk, Kim, & Feit, 2007; Miller, 2005). By contrast, nearly all Romanian orphans live in institutions prior to their adoptive placement, and in the time period relevant to this study (1989–1994), the state of those institutions was indescribably substandard. Furthermore, the general living conditions and health in the Romanian population were in many aspects inferior to those of many other sending countries (Miller, 2005). Hence, there are several reasons to believe that there are

important differences in both the quantity and gravity of the risk factors experienced before adoption, and that these vary according to country.

The few studies that include measures of geographic origin mostly find correlations between the risk of mental health problems and the geographical origin of adoptees; often, there is also evidence of age at adoption as an important pre-adoption factor (e.g. Behle & Pinquart, 2016; Hjern et al., 2002; Juffer & van IJzendoorn, 2005). The hegemonic explanation model for these associations is that country of origin is a proxy for pre-adoption deprivation, and that adoption age is not only a proxy for the duration of the child's exposure to the deprivation, but also their ability to form a close relationship with their adoptive parents (e.g. Behle & Pinquart, 2016; Cohen, 2006; Dekker et al., 2016; Odenstad et al., 2008; van den Dries et al., 2009).

Even though some studies consider the geographic origins of adoptees, they mostly use relatively crude categories that either differentiate between international and domestic adoptees or continents, or they single out one country of origin (such as South Korea, China, etc.) and compare it to the origins of the remaining adoptees (e.g. Dalen, 2001; Dalen & Rygvold, 2008; Dekker et al., 2016; Hjern et al., 2002; van den Dries et al., 2009). Such categorization yields less precise information about i) geographic origin as a proxy for pre-adoption adversity; and ii) from a preventive perspective, which subgroups of adoptees have elevated risks for developing certain psychiatric disorders.

Psychiatric Diagnoses: Who is at Risk?

A number of other studies also using register data have found increased risks of psychiatric outcomes among adoptees (Elmund, Lindblad, Vinnerljung, & Hjern, 2007; Hjern et al., 2002; Hjern, Vinnerljung, & Lindblad, 2004; Juffer & van IJzendoorn, 2005; Laubjerg et al., 2009; Lindblad et al., 2003; Wicks et al., 2010), and a meta-analysis carried out by Juffer and van IJzendoorn (2005) examining the effects of international adoption, behavioural problems and

mental health referrals (primarily on outcomes in childhood and adolescence), also showed that international adoptees were more often referred to mental health services than the non-adopted controls. However, this meta-analysis also showed that international adoptees were less often referred to mental health services and had fewer behavioural problems than domestic adoptees. These findings are in contrast to a more recent meta-analysis carried out by Behle and Pinquart (2016), estimating adoptees' relative risk of psychiatric disorders in general, and of eight individual disorders, in particular. Their findings show that adoptees are at an elevated risk for psychiatric disorders such as attention deficit hyperactivity disorder (ADHD), anxiety disorders, conduct disorders, oppositional defiant disorders, depression, substance use disorders, personality disorders and psychoses. Moreover, Behle and Pinquart's (2016) meta-analysis showed larger effect sizes in part in international than domestic adoptees. Hence, the results comparing international and domestic adoptees are in line with those of Dekker et al. (2016), but in contrast to those of Juffer and van IJzendoorn (2005).

Overall, the vast majority of studies comparing adoptees and non-adoptees find that adoptees are more likely to have a psychiatric disorder, and that they also have increased risks for developing certain individual disorders. Yet, the findings regarding international and domestic adoptees' risks of developing psychiatric disorders are ambiguous – one possible explanation for this is that there is great heterogeneity within the group of international adoptees both over time and within the same country of study, and also between the countries of study. This implies that the effects for international adoptees from different countries might cancel each other out when measured in one category (van den Dries et al., 2009). A similar problem also exists for the category of domestic adoptees, because many studies do not differentiate between adoption by step parents, kinship and non-kin adoption.

Knowing more about which adoptees are at the highest risk of psychiatric disorders and for developing certain individual disorders is a prerequisite for a better understanding of adoption and the potential consequences of this life event. Moreover, a more precise knowledge of which adoptees are at risk is necessary to target interventions that prevent or ameliorate psychiatric disorders within this group.

Research Questions

The purpose of the present study is to provide new knowledge on the prevalence of psychiatric contact and a range of psychiatric diagnoses among non-kin adoptees as compared to non-adoptees, and to determine whether the prevalence of both among non-kin adoptees is associated with country of origin. The study thus poses the following research questions:

1. Do non-kin adoptees have an overall higher risk of diagnosis with general psychiatric disorders and individual psychiatric disorders than non-adoptees?
2. Do within-group differences exist in terms of the psychiatric outcomes associated with the countries of origin of non-kin adoptees?

Methods

Data

For the analysis, I use Danish register data on all non-kin adoptees – both domestic and international – from the birth cohorts of 1989–1994 (N=3.180) and their non-adopted peers (N=418,272). This implies that I disregard step parent and kinship adoption (N=1,803), and adoptions for which there is missing information about the adoption type in the registers (N=67). Hence, the analytical sample for the period is 421,452. An overview of the data appears in Table 1.

Table 1. Persons from the 1989–1994 birth cohorts, by adoption status and adoption type: Observations and percentages

Birth year	Step parent or kinship adoption		Non-kin adoption		Missing information on adoption type		Non-adopted		Total
	Obs	%	Obs	%	Obs	%	Obs.	%	Obs.
1989	393	0.57	514	0.75	14	0.02	67.560	98.66	68.481
1990	393	0.56	516	0.74	11	0.02	69.104	98.69	70.024
1991	312	0.45	529	0.76	15	0.02	68.774	98.77	69.630
1992	269	0.37	505	0.70	11	0.02	71.062	98.91	71.847
1993	232	0.33	560	0.80	8	0.01	69.571	98.86	70.371
1994	204	0.28	556	0.76	8	0.01	72.201	98.95	72.969
Total	1.803	0.43	3.180	0.75	67	0.02	418.272	98.81	423.322

Note: $Chi^2(15) = 132.11$. $p < 0.0001$.

Statistics Denmark provides information about adoptions via the adoption register, which, among other things, includes detailed information about adoption type, age at adoption, country of origin, date of adoption and parents' age at adoption from 1989 onwards. The data available before 1989 does not include exact information about these adoption characteristics even though they allow for the identification of adoption status. For this reason, the oldest birth cohort included in the analysis is that of 1989. Because this paper investigates the likelihood of psychiatric outcomes by age 20, this limits the analysis to the 1994 birth cohort as the youngest included because data on psychiatric diagnoses are only available up to 2014.

Apart from data on adoption and psychiatric diagnoses, the analysis also includes information from other register sources about the sociodemographic background variables of the analytical sample.

Statistical Analysis

Chi^2-tests of independence and t-tests of differences in means are carried out for the descriptive statistics about psychiatric outcomes, characteristics of adoption and sociodemographic background variables for the adoptees and non-adoptees, and also for the within-group differences between the adoptees by country of origin. I use logistic regression models to analyse the psychiatric outcomes (adjusting for sociodemographic background variables), and in the part of the

analysis that is limited to adoptees, I also adjust for adoption characteristics. In all of the analysis, dummies of birth cohorts are included to control for possible cohort effects.

Measures

Outcomes: Psychiatric contact and disorders. Prevalence (%) of psychiatric contact and a range of categories of psychiatric disorder is first analysed for adoptees and non-adoptees, then within the groups of adoptees by country. All measures are dichotomized and draw on information from the Danish Psychiatric Central Research Register (Centre for Danish Register Research, 2017.). The categories of disorder follow the World Health Organization's ICD-10 classification, as specified in the register. Apart from the overall measure of 'Psychiatric contact', I only examine the psychiatric disorders that are empirically evident as the 10 most prevalent among adoptees (see Table 2). Because the analysis investigates psychiatric disorders occurring from birth up to age 20, disorders that are primarily prevalent in childhood and adolescence (F90–99) are singled out and measured as individual diagnosis categories, e.g. F90 hyperkinetic disorders, whilst disorders (F01–F89) are measured using the ICD-10 categories, for example, F30–F39 affective disorders.

Table 2. Comparison of the prevalence of registration in the psychiatric register and psychiatric disorders of adoptees and non-adoptees at age 20: Percentages and Chi^2-test

	Non-adoptees %	Non-kin adoptees %
In psychiatric register at age 20	8.964	17.516***
Nervous and stress-related disease with anxiety-related physical symptoms	5.583	9.119***
Hyperkinetic disorder	1.830	4.403***
Personality structure disorders	1.680	4.057***
Affective mental disorders	2.713	3.868***
Social functioning disorders in childhood/adolescence (including reactive attachment disorders)	0.319	3.113***
Schizophrenic disorders and psychoses	1.348	3.050***
Mental retardation	0.490	2.704***
Unspecified psychiatric disorder	1.097	2.610***
Observation, high-risk, special condition (judgment, socioeconomic condition)	0.881	2.358***
Autistic disorder	1.141	2.233***
Observations	418,272	3,180

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

Independent variable

Country of origin. I analyse the six most frequent countries of origin for non-kin adoptees born in 1989–1994 and a sixth group consisting of the rest of the non-kin adoptees from other countries, or whose country information missing. Because I am investigating psychiatric contacts and certain psychiatric diagnoses, i.e. relatively infrequent outcomes, it is necessary to have enough individuals in each country category to be able to identify statistically significant associations with psychiatric outcomes. Therefore, the country categories include at least 100 individuals.

In the analysis, 'country of origin' contains the following seven categories: South Korea (n=630), Columbia (n=581), India (n=412), Denmark (n=238), Sri Lanka (n=173), Romania (n=137) and other countries or those with missing country information (n=921).

Confounding variables

In the two comparative regression analyses of non-kin adoptees and non-adoptees, the following confounders are included: birth year, gender, non-Danish origin (whether a person has immigrant status or at least one parent with immigrant status – note that international adoptees are registered as having Danish nationality), out-of-home placement (at least once after birth/adoption and before their 18th birthday), parents' cohabiting status, mother's educational level (compulsory school or less, high school or vocational training, short- or medium-term further education, long-term further education), mother's low-income status (income in the lowest income quintile), mother's mental health (mother registered in the psychiatric register), father's educational level, father's low-income status and father's mental health. The last four measures of paternal characteristics are coded similarly to the same measures used for mothers.[2]

In the regression analyses of non-kin adoptees only, all of the abovementioned confounders are included except the variable non-Danish origin, because all international non-kin adoptees are categorized as being of Danish nationality upon their arrival in Denmark.

[2] I do not differentiate between heterosexual parents, same sex parents and single parents.

Results

Examining the first research question asking whether non-kin adoptees have a higher risk of having had a psychiatric contact by age 20, bivariate analysis shows that the percentage of non-kin adoptees with psychiatric contacts is almost twice as high (17.5%) as it is for non-adoptees (9.0%) (see Table 2). Furthermore, the differences in percentages of individual diagnoses are higher among adoptees, and all the types of disorders included in the analysis are significantly more prevalent among adoptees. The diagnoses in which I find the greatest relative difference between adoptees and their non-adopted peers are: social functioning disorders in childhood/adolescence (including reactive attachment disorder) (OR=10.04), mental retardation (OR=5.64), personality structure disorders (OR=2.74), observation (OR=2.72), and hyperkinetic disorders (such as ADHD) (OR=2.47).

Table 3. Logistic regression models of psychiatric diagnoses of non-kin adoptees and non-adoptees

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
	In psychia-tric register at age 20	Nervous and stress-related disease with anxiety-related physical symp-toms	Hyper-kinetic disorder	Person-ality structure disorders	Affec-tive mental dis-orders	Social functioning disorders in childhood adolescence (incl. reactive attachment disorders)	Schizo-phrenia, schizo-typic mental disorder, paranoid psychoses	Mental retar-dation	Un-specified psychia-tric disorder	Obser-vation, high-risk, special condition	Autis-tic dis-order
Non-kin adoptees	2.604***	2.051***	4.002***	3.375***	1.590***	19.21***	2.815***	7.655***	2.829***	3.484***	1.728***
	(0.133)	(0.139)	(0.374)	(0.337)	(0.155)	(2.489)	(0.312)	(0.962)	(0.356)	(0.449)	(0.227)
N	338,613	338,613	338,613	338,613	338,613	338,613	338,613	338,613	338,613	338,613	338,613
Pseudo R^2	0.078	0.069	0.105	0.110	0.049	0.198	0.059	0.118	0.061	0.092	0.062

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

1. Standard errors in parentheses

2. In all models, controls of birth year, gender, out-of-home placement, ethnicity, parents' cohabiting status, mother's educational level, mother's low-income status, mother's mental health, father's educational level, father's low-income status and father's mental health have been included in the estimations.

The next step of this comparative analysis of adoptees and non-adoptees examines if the associations between adoption status, and whether the different psychiatric diagnoses, persist when important individual and parental background variables are controlled for. This step of the analysis

includes logistic regression models for psychiatric contact by age 20, and (among the adoptees) the 10 most prevalent diagnosis categories by age 20. Table 3 presents the results, which support the descriptive findings from Table 2. Non-kin adoptees are more than twice as likely to have had psychiatric contacts by age 20 after controlling for covariates (OR=2.6) (Model 1), and examining the associations between the individual diagnosis categories after controlling for covariates (Models 2–11) results in even larger ORs for almost all diagnosis categories.

In particular, it is conspicuous that the odds of having a social functioning disorder in childhood or adolescence (including reactive attachment disorders) is 19 times higher for adoptees than it is for non-adoptees, followed by elevated odds of mental retardation (OR=7.6), hyperkinetic disorders (OR=4.0), observation/high-risk/special condition (OR=3.5) and personality structure disorders (OR=3.4). These results clearly illustrate that not only are non-kin adoptees at a greater risk of having psychiatric contact than their non-adopted peers, but there are also some types of diagnoses where adoption status is a much stronger risk factor. Furthermore, the enhanced ORs after controlling for individual and parental socioeconomic background suggest that the relatively higher socioeconomic backgrounds of the adoptive parents of non-kin adoptees mitigate the risk of psychiatric diagnoses. Still, even though Table 3 shows some large ORs, it is important to bear in mind that the OR measure is an expression of a ratio of two odds. In the interpretation of the findings in Table 3, it is therefore relevant to consider the prevalence measures in Table 2. While I find that between-group relative differences, and thus ORs, are greater for some of the less prevalent psychiatric outcomes, the greatest absolute percentage point differences between groups for nervous and stress-related disease with anxiety-related physical symptoms (a 3.5 percentage point difference) and hyperkinetic disorders (a 2.6 percentage point difference) is still very relevant to consider from a prevention and treatment perspective, as these disorders are the most prevalent among non-kin adoptees.

Having established that non-kin adoptees in Denmark have a considerably higher likelihood of being diagnosed with a range of psychiatric disorders than non-adoptees, I proceed to the second research question about the hypothesized within-group differences in psychiatric contact and psychiatric disorders associated with the adoptees' countries of origin, which limits the analysis to non-kin adoptees. This part of the analysis investigates whether there is an association between country of origin and mental health. However, as mentioned in the methods section, I am not able to analyse all the psychiatric outcomes in Table 2 by country of origin due to the smaller sample resulting in small numbers for some of the combinations of psychiatric outcomes and country of origin. For this reason, the results in Tables 4 and 5 are limited to the following psychiatric outcomes: psychiatric contact, nervous and stress-related diseases with nervous-determined physical symptoms, hyperkinetic disorder, personality structure disorder and affective mental disorders.

Table 4 reports descriptive statistics on adoptive, individual and parental characteristics of adoptees categorized by country of origin. As hypothesized, there is considerable heterogeneity within the group of adoptees in the psychiatric outcomes measures, but also in some of the adoption, individual and parental background variables. The Romanian adoptees have a higher prevalence of psychiatric contacts, but also of nervous and stress-related diseases with nervous-determined physical symptoms, hyperkinetic disorders and personality structure disorders when compared to adoptees from other countries. At the other end of the prevalence continuum, the analysis shows that adoptees from South Korea have a lower overall prevalence of psychiatric contacts, and that it is conspicuous that relatively few have a hyperkinetic disorder (1.6%). This percentage is on par with non-adoptees from the cohorts of 1989–1994 (1.83%) (see Table 2). Hence, the results in Table 4 show that there is considerable heterogeneity in the psychiatric outcomes within the group of adoptees.

Table 4. Percentages and means of model outcomes and covariates for adoptees by country of origin

	Colombia	South Korea	India	Denmark	Sri Lanka	Romania	Other country/missing information on country	Sig
In psychiatric register by age 20	15.799	12.808	14.508	19.524	13.855	45.082	19.610	***
Nervous and stress-related disease with anxiety-related physical symptoms	7.361	6.897	11.140	8.095	11.446	13.934	9.748	*
Hyperkinetic disorder	4.129	1.642	3.627	6.667	4.819	11.475	5.390	***
Personality structure disorders	3.770	3.120	5.699	2.381	4.217	7.377	4.713	ns
Affective mental disorders	4.488	3.777	4.145	3.810	4.819	4.098	3.555	ns
Male	63.555	47.291	17.876	56.190	50.000	59.016	52.064	***
Birth year								
1989	18.133	19.540	19.171	18.571	18.675	9.016	10.321	***
1990	20.287	17.077	12.953	19.524	21.084	8.197	14.794	**
1991	15.081	17.241	13.731	13.810	24.096	11.475	17.431	*
1992	17.415	14.450	11.399	18.571	16.265	22.951	16.972	*
1993	15.260	14.286	20.984	14.762	14.458	21.311	19.954	**
1994	13.824	17.406	21.762	14.762	5.422	27.049	20.528	***
Mean age at adoption	1.305	0.292	1.723	1.110	0.480	3.115	2,586	***[a]
Out-of-home placement	6.822	3.448	3.627	5.238	4.819	12.295	9.289	***
Parents cohabiting	75.045	76.190	79.016	77.143	71.687	81.148	77.408	ns
Mother's mean age at adoption	33.738	35.573	34.453	33.933	34.380	34.033	34.830	ns[b]
Mother's educational level								
Compulsory school or less	9.336	22.332	23.316	18.571	12.048	21.311	17.546	***
High school or vocational training	39.677	29.721	33.679	7.143	24.699	0.34.426	30.046	***
Short- or medium-length further education	40.575	42.693	33.938	40.000	55.422	35.246	40.596	***
Long-term further education	10.413	5.255	9.067	4.286	7.831	9.016	11.812	***
Mother's income: lowest income quintile	9.874	12.479	11.658	8.095	12.651	10.656	8.257	ns
Mother's psychiatric diagnosis	5.745	4.598	7.254	6.667	3.012	8.197	5.505	ns
Father's age at adoption	35.199	37.110	36.378	35.314	36.295	35.844	36.302	ns[c]
Father's educational level								
Compulsory school or less	9.515	12.808	15.544	11.429	9.639	15.574	12.844	ns
High school or vocational training	42.190	48.768	47.150	43.810	27.711	49.180	45.872	***
Short- or medium-	27.828	21.346	23.575	34.762	39.759	25.410	25.000	***

length further education								
Long-term further education	20.467	17.077	13.731	10.000	22.892	09.836	16.284	***
Father's income: lowest income quintile	14.004	10.509	13.472	19.048	15.060	11.475	14.106	ns
Observations	2,922							

However, these results do not necessarily support a hypothesis about country of origin as a proxy for pre-adoption adversity. Table 4 also shows individual and parental background differences between adoptees with different countries of origin that may explain – or at least partly explain – the associations between countries of origin and psychiatric outcomes. For example, mean ages at adoption for adoptees from South Korea and Romania are very different (age 0.3 and 3.1 years old, respectively), showing that regardless of the extent of their pre-adoption adversities, adoptees from Romania on average have also been exposed to their pre-adoption circumstances for a longer period of time than the other adoptees.

When examining the prevalence of out-of-home placements after adoption by country of origin, Romanian adoptees also have a high prevalence (12.3%), and again, South Korean adoptees are their counterparts with a prevalence of 3.5%, which is lower than it is for non-adoptees (cf. Appendix A). The same is true for Indian adoptees, with an out-of-home placement prevalence of 3.6%. Out-of-home placement can be interpreted as adoption failure when it occurs after adoption because the aim of adoption is partly to avoid an out-of-home placement, as it often implies more childhood instability than adoption.

Analysing the parental socioeconomic background variables, Table 4 also shows that there are some variations between the groups in terms of their parents' socioeconomic resources, but there is not a clear systematic pattern. Overall, the adoptive parents are relatively well educated, few are in the lowest income quintile, and the parents of adoptees are to a much larger extent still

cohabiting when their children are aged 19, compared to the average mothers and fathers of non-adoptees in these six cohorts (not reported in table).

The final step of the analysis examines the associations between psychiatric outcomes and country of origin, controlling for adoptees' background characteristics. Because the Romanian adoptees have a higher prevalence in almost all of the psychiatric categories in Table 4, they are the reference category in the logistic regressions presented in Table 5.

Table 5. Logistic regression models of psychiatric diagnoses by country of origin: Non-kin adoptees, odds ratios

	Model A Psychiatric contacts	Model B Nervous and stress-related disease with anxiety-related physical symptoms	Model C Hyperkinetic disorder	Model D Personality structure disorders	Model E Affective mental disorders
Country of origin (ref: Romania)					
Colombia	0.323***	0.585	0.448	0.709	1.123
	(0.0805)	(0.198)	(0.194)	(0.338)	(0.586)
South Korea	0.291***	0.566	0.272**	0.607	1.069
	(0.0766)	(0.202)	(0.134)	(0.308)	(0.593)
India	0.281***	0.750	0.743	0.723	0.954
	(0.0736)	(0.260)	(0.325)	(0.339)	(0.530)
Denmark	0.459**	0.679	1.066	0.420	1.115
	(0.134)	(0.269)	(0.477)	(0.257)	(0.691)
Sri Lanka	0.333**	0.984	0.809	0.835	1.235
	(0.112)	(0.401)	(0.415)	(0.495)	(0.762)
Other country or missing information	0.321***	0.683	0.514	0.578	0.834
	(0.0723)	(0.212)	(0.187)	(0.250)	(0.421)
≤ 2 years old at adoption	1.517**	1.349	1.473	1.612*	1.304
	(0.196)	(0.214)	(0.341)	(0.355)	(0.312)
Observations	2,922	2,922	2,922	2,922	2,922
Pseudo R^2	0.096	0.053	0.190	0.089	0.046

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

1. Standard errors in parentheses

2. In all models, birth year, gender, out-of-home placement, parents' cohabiting status, mother's educational level, mother's low-income status, mother's mental health, father's educational level, father's low-income status and father's mental health have been included as controls in the estimations.

Table 5 shows that Romanian adoptees, even after controlling for covariates, are significantly more likely to have psychiatric contacts when compared to all the other adoptees, regardless of their country of origin (Model A). Except for the domestic adoptees from Denmark, the other adoptees are about three times less likely than the Romanian adoptees to have psychiatric contacts. Non-kin adoptees born in Denmark, however, only are about two times less likely to have psychiatric contacts than the Romanian adoptees (OR=0.46). Further analysis (not reported in Table 5) also reveals that domestic non-kin adoptees have significantly higher odds of psychiatric contacts than adoptees from either India or Korea (ORs=1.6).

Surprisingly, when examining the other psychiatric outcomes (Models B–E), the Romanian adoptees are not significantly different from any of the other country groups of adoptees, except for the South Korean adoptees who have 3.8 times lower odds of hyperkinetic disorders (OR=0.27). Even though the ORs for all the other models suggest that Romanian adoptees have elevated odds of the psychiatric disorders, the coefficients are not statistically significant. However, further analysis (not reported in Table 5) reveals that domestic non-kin adoptees also have significantly elevated odds of hyperkinetic disorders when compared to both South Korean (OR=3.9) and Indian (OR=3.4) adoptees.

Table 4 already showed considerable variation in the prevalence of different psychiatric diagnoses within the group of adoptees; but, like the associations between psychiatric diagnoses and adoption status changed after adjusting for the covariates (cf. Table 3), the insignificant results in Table 5 also suggest that other adoptive characteristics, such as adoption age, individual characteristics, parental resources and other childhood events (such as out-of-home placements) are associated with the likelihood of being diagnosed with a psychiatric illness. Overall, adoption at age 2 or older implies elevated odds of having psychiatric outcomes, but only the coefficients of

psychiatric contact (OR=1.5) (Model A) and personality structure disorders (OR=1.6) (Model D) are statistically significant.

Discussion

The present study is not the first to compare the mental health of adoptees and non-adoptees. However, no previous study has explicitly investigated all the mental health outcomes included in this study as they apply to non-kin adoptees. Moreover, the present study is the first to examine how the odds of having psychiatric contact and five individual diagnoses, respectively, vary in young adulthood according to the countries of origin of non-kin adoptees.

Although the individual psychiatric outcome measures, the age at measurement (age 20) and the demarcation of the analytic samples upon which the present analysis depends differ from those of the empirical findings in similar studies (i.e. Behle & Pinquart, 2016; Dekker et al., 2016; Juffer & van IJzendoorn, 2005; Laubjerg et al., 2009), it is still possible to identify patterns of similarities and deviations in the findings.

The present results clearly show that 'non-kin adoptee' status is a risk factor for psychiatric outcomes when compared to non-adoptees, which is in line with the majority of previous studies (e.g. Behle & Pinquart, 2016; Dekker et al., 2016; Hjern et al., 2002; Juffer & van IJzendoorn, 2005; Laubjerg et al., 2009; Pace & Zavattini, 2011). The elevated odds of psychiatric contact found in the present study (OR=2.6) is on par with findings in the meta-analysis of Behle & Pinquart (2016), but I also show that non-kin adoptees are particularly at risk for social functioning disorders in childhood/adolescence (including reactive attachment disorders) and hyperkinetic disorders. The findings regarding social functioning particularly support the theoretical hypothesis about the importance of the quality of early attachment and how, for some adoptees, this factor may result in psychopathology later in life. Reactive attachment disorders result from an insecure attachment at an early age (Rechenbach, 2003), and they are therefore a proxy for just that. Even

though the analysis did not directly test the adoptees' attachment relations, it still extends other studies by showing adoptees to have less attachment security than their non-adopted peers, as measured by various assessment instruments, e.g. the Strange Situation Procedure (van den Dries et al., 2009), because the findings here show a similar result using register data on actual diagnoses. Moreover, the findings on hyperkinetic disorders could also partly be explained by insecure attachment early in life, as they also impact children's later adaption and ability to self-regulate. Hyperkinetic disorders, like ADHD, can also be a result of various physical factors, such as prenatal alcohol and drug exposure and/or a genetic component (Dalen & Rygvold, 2008; Miller, 2005). Hence, taking a prevention perspective on attention to social functioning disorders in childhood/adolescence (including reactive attachment disorders) and hyperkinetic disorders in populations of non-kin adoptees is of great importance. Still, the single most prevalent diagnosis category for non-kin adoptees is nervous and stress-related disorders, so the results show that internal disorders are very prevalent among non-kin adoptees, and that attention to nervous and stress-related disorders, like anxiety, is also very important from a prevention perspective.

Like Laubjerg et al.'s (2009) findings, the present study also shows that adoptive parents' higher educational and income levels are not sufficient to reduce the risk of psychiatric contact and diagnoses – however, at the same time, the results also illustrate that adoptive parents' relatively higher socioeconomic resources are important, as all things equal their resources do indeed ameliorate the risk of psychiatric illness for the adoptees.

The second part of the analysis examined if there are within-group differences in psychiatric outcomes associated with the country of origin of the non-kin adoptees. Analysing psychiatric contacts, I found that Romanian adoptees have a higher likelihood of psychiatric contacts when compared to all the other adoptees, regardless of country of origin. The result is unsurprising given what we know about the conditions experienced by Romanian adoptees prior to their adoption –

particularly for the 1989–1994 cohorts. However, the results also underscore the importance of the continuing focus on Romanian adoptees' mental health and the importance of considering their situations, not only as children and adolescents, but also as young adults. In contrast, the results showing that non-kin adoptees born in Denmark also have an elevated likelihood of psychiatric contact compared to Korean and Indian adoptees were surprising, as two recent studies (Behle & Pinquart, 2016; Dekker et al., 2016) suggest that international adoptees have a higher risk of mental health problems when compared to domestic adoptees. As neither of these studies differentiates between international adoptees' countries of origin, their diverging results when compared to the results in this present study may be due to heterogeneity within the group of international adoptees. For example, both Romanian and South Korean adoptees may be included in such a category, and as my results clearly show, they are at two extreme ends of the risk continuum of mental health problems in adoptees, thus grouping them together distorts this fact.

The fact that Danish-born non-kin adoptees have elevated odds of psychiatric contacts and hyperkinetic disorders when compared to Indian and South Korean adoptees suggests that there are pre-adoption factors other than general living conditions and the quality of the baby institutions in Denmark (both of which are relatively better/higher than those of the international sending countries) at play. However, the reasons for Danish parents giving their children up for adoption or in some cases unwillingly having to give them up for adoption in the period 1989–1994 will probably still be related to extreme circumstances, such as drug or alcohol abuse, because the availability of social support and social services in Denmark for single mothers or disadvantaged families with low or no income is high. If this is the case, then relatively more of the Danish-born non-kin adoptees may have been exposed to prenatal alcohol or drugs, which could be one – but obviously not the only – explanation for their later psychiatric problems. There exists little public documentation on the mothers who chose to give their children up in that period, but future studies

using Danish register data should be able to link data from the biological mothers that might shed some light on why domestic non-kin adoptees born in Denmark have relatively high rates of both psychiatric contact and hyperkinetic disorders.

Limitations and Conclusions

Even though this study's analysis is based on a relatively large sample population of non-kin adoptees in Denmark, the study is still limited by the numbers of adoptees from different countries of origin. It was only possible to conduct meaningful regression analysis on six individual countries, with a seventh category encompassing adoptees from many different countries or those with missing country information. Hence, the study was only able to investigate the heterogeneity of mental health problems for the adoptees from these six countries. Moreover, the study is also limited in terms of the distribution of these seven country categories with regard to the individual psychiatric diagnoses, since these numbers also fell short. This resulted in a limitation of the regression analysis within the group of adoptees to only five out of ten psychiatric diagnoses. Initially, these were investigated in comparison to those of non-adoptees, and descriptively for the non-kin adoptees alone. In relation to this limitation, some of the insignificant results in the regression analysis of the psychiatric diagnoses by country of origin (Table 5, Models B–E) may also be due to lack of statistical power.

Despite these limitations, this study's analysis has not only contributed new insight into non-kin adoptees' mental health, as compared to that of non-adoptees, but also into heterogeneity in terms of the likelihood of psychiatric outcomes within the group of non-kin adoptees.

In conclusion, 17.5% of the non-kin adoptees have had psychiatric contact by age 20, which is 2.6 times the likelihood of the same occurring for non-adoptees, ceteris paribus. So even though a clear majority of non-kin adoptees seem to be in the normal range of psychological functioning and should not be pathologized, as Haugaard (1998) emphasizes, it still represents a large percentage of

non-kin adoptees, which calls for increased attention and support. In this regard, the results show that nervous and stress-related disorders are the single most prevalent diagnosis, but that the highest relative likelihood when compared to non-adoptees is found in social functioning disorders in childhood/adolescence (including reactive attachment disorders), and hyperkinetic disorders.

Moreover, the analysis in this study has shown that there are important differences in the likelihood of psychiatric contact and the likelihood of hyperkinetic disorders within the group of non-kin adoptees. Here, the message is that Romanian adoptees, in particular, have a higher likelihood of psychiatric contacts than all other adoptees, and a higher likelihood of experiencing hyperkinetic disorders when compared to South Korean adoptees. Nonetheless, domestic (Danish) non-kin adoptees also have a higher likelihood of psychiatric contacts and hyperkinetic disorders than Indian and South Korean adoptees. This was a surprising finding, but also important, as domestic non-kin adoptees' mental health problems might be, to some extent, overshadowed by the focus on children whose experiences indicate more obvious cases of deprivation, such as the Romanian adoptees.

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