

# Developmental Psychopathology and Physical Health Conditions During Childhood and Adolescence

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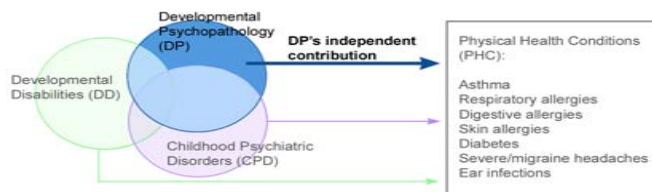
## Background

Previous research has reported that developmental psychopathology (DP) and developmental disabilities (DD) are often on the causal pathway to psychiatric disorders. At the same time, studies with a cross-sectional design have reported the comorbidity of DP, DD, and childhood psychiatric disorders (CPD). Numerous studies have found that these comorbidities during childhood are, in fact, significant predictors for developing mental and physical diseases later in life (adulthood and adulthood). However, previous research often focused only on diagnosed childhood disabilities or psychiatric disorders and overlooked the individual role and contribution of developmental psychopathology. This can, in part, be because DP is not full-blown or may not meet clinical diagnostic criteria. Developmental psychopathology, which is recognizable at early ages, may be an important predictor of significant psychiatric disorders as well as physical morbidities occurring later in life.

### Research Question

To investigate the extent to which developmental psychopathology, independent of childhood psychiatric disorders and developmental disabilities, is associated with physical health conditions in childhood and adolescence.

Figure 1. Conceptual model



## Methods

**Study Design and Participants:** This study analyzed cross-sectional parent-reported data on children aged 6-17 years from the National Survey of Children's Health (NSCH), 2003-2004. Although NSCH provided data for children aged 0-17 years, variables used to construct developmental psychopathology were only available for children aged 6-17 years.

A total of 69,031 children were aged 6-17 in NSCH. In order to limit analyses to children without CPD or DD, children with the following conditions were excluded: autism, ADD/ADHD, learning disabilities, hearing or vision problems, and speech problems. This exclusion allows us to examine the effect of DP in the absence of CPD and DD (see figure 1). As a result 56,286 children were included in the report.

**Exposure Measure:** Two developmental psychopathology measures were included in this study - externalizing and internalizing emotional problems

1) Externalizing emotional problems (EEP) – mean of the total score of the following six questions (coding 1=never, 2=sometimes, 3=usually, 4=always)

- ◆ [He/She] argues too much.
  - ◆ [He/She] gets along well with other children. (reversely coded)
  - ◆ [He/She] bullies, or is cruel or mean to others.
  - ◆ [He/She] is disobedient.
  - ◆ [He/She] shows respect for teachers and neighbors. (reversely coded)
  - ◆ [He/She] is stubborn, sullen, or irritable.
- The mean value 0-<1 is coded as 'never', 1-<2 'sometimes', 2-4 'usually/always'.

2) Internalizing emotional problems (IEP) – mean of the total score of the following three questions (coding 1=never, 2=sometimes, 3=usually, 4=always)

- ◆ [He/She] feels worthless or inferior.
  - ◆ [He/She] is unhappy, sad, or depressed.
  - ◆ [He/She] is withdrawn, and does not get involved with others.
- The mean value 0-<1 is coded as 'never', 1-<2 'sometimes', 2-4 'usually/always'.

**Outcome Measures:** Each of the physical health conditions was dichotomously coded as Yes/No by asking parents "Have you been told by a doctor or other health care professional that [He/She] had [condition]?"

- ◆ Asthma [ever had]
- ◆ Hay fever or any kind of respiratory allergy [during the past 12 months]
- ◆ Any kind of food or digestive allergy [during the past 12 months]
- ◆ Eczema or any kind of skin allergies [during the past 12 months]
- ◆ Frequent or severe headaches, including migraines [during the past 12 months]
- ◆ Three or more ear infections [during the past 12 months]

A summary outcome variable was created:

- ◆ Combined health conditions: at least one of the listed six conditions

### Statistical Analysis:

- ◆ Methods of variance estimation accounting for the complex sample design (multi-stage sampling with weighting) were applied. Specifically, standard errors were obtained using the Taylor-series approximation method.
- ◆ Weighted data and survey commands were used in bivariate and multivariate logistic regression.
- ◆ Multivariate logistic regression was used to estimate the effect of developmental psychopathology (i.e. EEP and IEP) on odds of each of the physical health conditions. Child age (in years), child sex, child race, child birth order, and household poverty level were controlled for in each multivariate model.

## Results

◆ Unadjusted prevalence (using 56,286 as the denominator) for each condition is: asthma 12.8% (n=7183), respiratory allergy 17.0% (n=9537), digestive allergy 3.0% (n=1663), skin allergy 8.3% (n=4677), severe/migraine headaches 5.7% (n=3212), three or more ear infections 2.4% (n=1333), and at least one of the above condition 34.3% (n=19296).

◆ Results from multivariate analyses indicated that elevated EEP and IEP were both independently associated with each physical health condition. The associations appeared stronger when EEP and IEP were more severe – an indication of a dose-response relationship.

Table 1. Unadjusted associations between developmental psychopathology and physical health conditions

	Asthma			Respiratory Allergies			Digestive Allergies			Skin Allergies		
	Yes/No	OR	95% CI	Yes/No	OR	95% CI	Yes/No	OR	95% CI	Yes/No	OR	95% CI
<b>Ext EP</b>												
Never	512 / 4031	Ref		568 / 3972	Ref		106 / 4437	Ref		276 / 4266	Ref	
Sometimes	5884 / 40777	1.21	1.03, 1.42	8008 / 38581	1.75	1.51, 2.02	1376 / 45289	1.54	1.13, 2.08	3858 / 42802	1.48	1.20, 1.83
Usually / Always	746 / 3965	1.76	1.44, 2.15	929 / 3783	2.06	1.71, 2.47	176 / 4538	1.81	1.21, 2.71	517 / 4198	2.10	1.63, 2.70
<b>Int EP</b>												
Never	3460 / 25430	Ref		4403 / 24455	Ref		785 / 28108	Ref		2140 / 26756	Ref	
Sometimes	3489 / 22372	1.12	1.02, 1.23	4876 / 20947	1.29	1.19, 1.39	821 / 25043	1.06	0.89, 1.27	2383 / 23477	1.25	1.13, 1.39
Usually / Always	161 / 754	1.59	1.21, 2.10	182 / 732	1.26	0.96, 1.64	45 / 871	1.47	0.94, 2.32	109 / 806	2.18	1.54, 3.08
<b>Severe Headache</b>												
	Yes/No	OR	95% CI	Yes/No	OR	95% CI	Yes/No	OR	95% CI			
<b>Ext EP</b>												
Never	195 / 4349	Ref		76 / 4466	Ref		1253 / 3295	Ref				
Sometimes	2593 / 44107	1.40	1.07, 1.83	1067 / 45626	1.57	1.11, 2.21	15872 / 30854	1.50	1.34, 1.69			
Usually / Always	408 / 4313	2.57	1.88, 3.51	181 / 4536	2.75	1.82, 4.16	1939 / 2783	2.15	1.85, 2.50			
<b>Int EP</b>												
Never	1315 / 27600	Ref		612 / 28300	Ref		9063 / 19865	Ref				
Sometimes	1730 / 24154	1.54	1.35, 1.78	864 / 25213	1.20	1.00, 1.44	9514 / 18389	1.28	1.18, 1.34			
Usually / Always	130 / 787	3.72	2.68, 5.16	49 / 867	2.87	1.86, 4.44	402 / 515	1.65	1.31, 2.07			

Note 1: Shown in Yes/No are raw numbers

Note 2: Weighted data and survey commands were used to estimate OR (95% CI)

Table 2. Adjusted associations between developmental psychopathology and physical health conditions

	Asthma		Respiratory Allergies		Digestive Allergies		Skin Allergies		Severe Headache		Frequent ear Infections		Combined health conditions	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<b>Ext EP</b>														
Sometimes	1.16	0.98, 1.38	1.55	1.34, 1.79	1.38	1.00, 1.89	1.44	1.17, 1.78	1.51	1.13, 2.03	1.38	0.94, 2.01	1.41	1.25, 1.59
Usually / Always	1.72	1.39, 2.12	1.89	1.57, 2.27	1.70	1.11, 2.60	2.09	1.61, 2.70	2.36	1.69, 3.30	2.55	1.63, 4.00	2.01	1.72, 2.35
<b>Int EP</b>														
Sometimes	1.12	1.02, 1.23	1.27	1.18, 1.37	1.08	0.90, 1.29	1.28	1.15, 1.43	1.43	1.25, 1.64	1.13	0.93, 1.37	1.23	1.15, 1.31
Usually / Always	1.80	1.34, 2.42	1.50	1.14, 1.98	1.66	1.02, 2.71	2.59	1.80, 3.72	3.28	2.27, 4.72	4.24	2.69, 6.66	1.91	1.51, 2.42

Note 1: Weighted data and survey commands were used to estimate OR (95% CI)

Note 2: "Never" was the reference

Note 3: Models controlled for child sex, continuous age, birth order, race, and household poverty level

## Discussion

Developmental psychopathology, independent of psychiatric disorders and developmental disabilities, is a correlate for various physical medical conditions during childhood and adolescence. Developmental psychopathology can be an early indicator or antecedent of health problems even when children do not have a clinical diagnosis of either psychiatric disorders or developmental disabilities at the time. An early identification of high risk children makes early intervention possible and can potentially maximize treatment effect. Therefore, treatment and intervention targeted to protect against future physical morbidities in children and adolescents should consider including a psychopathology component