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### **Supplemental Material**

#### **Prenatal and Postnatal PCB-153 and *p,p'*-DDE Exposures and Behavior Scores at 5–9 Years of Age among Children in Greenland and Ukraine**

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**Table S1.** Crude odds ratios (95% CI) for abnormal<sup>a</sup> behavior scores associated with a doubling of prenatal and postnatal PCB-153 and *p,p'*-DDE.

Outcome	Greenland		Ukraine		Pooled <sup>b</sup>	
	n total	Crude OR	n total	Crude OR	n total	Crude OR
<b>Prenatal PCB-153</b>						
Total difficulties	516	0.93 (0.73, 1.19)	492	1.22 (0.80, 1.84)	1008	1.00 (0.81, 1.24)
Emotional	518	0.89 (0.72, 1.09)	492	1.13 (0.74, 1.72)	1010	0.93 (0.77, 1.12)
Conduct	518	1.16 (0.96, 1.40)	492	1.32 (0.93, 1.87)	1010	1.19 (1.01, 1.41)
Hyperactivity	516	1.18 (0.88, 1.58)	492	0.90 (0.59, 1.37)	1008	1.08 (0.85, 1.38)
Peer	517	1.00 (0.87, 1.15)	492	1.14 (0.87, 1.50)	1009	1.03 (0.91, 1.17)
Prosocial	517	1.09 (0.91, 1.30)	492	0.88 (0.65, 1.18)	1009	1.03 (0.89, 1.20)
<b>Postnatal PCB-153</b>						
Total difficulties	482	0.77 (0.62, 0.96)	485	0.97 (0.75, 1.26)	967	0.85 (0.72, 1.00)
Emotional	484	0.85 (0.71, 1.02)	485	0.94 (0.73, 1.23)	969	0.88 (0.76, 1.02)
Conduct	484	0.95 (0.81, 1.13)	485	1.00 (0.81, 1.25)	969	0.97 (0.85, 1.11)
Hyperactivity	482	0.85 (0.66, 1.09)	485	0.76 (0.59, 0.99)	967	0.81 (0.68, 0.97)
Peer	483	0.96 (0.84, 1.09)	485	1.14 (0.95, 1.36)	968	1.01 (0.91, 1.12)
Prosocial	483	1.10 (0.93, 1.30)	485	0.92 (0.76, 1.12)	968	1.02 (0.90, 1.16)
<b>Prenatal <i>p,p'</i>-DDE</b>						
Total difficulties	516	1.00 (0.79, 1.27)	492	1.41 (0.88, 2.25)	1008	1.07 (0.86, 1.34)
Emotional	518	0.95 (0.78, 1.16)	492	1.25 (0.77, 2.02)	1010	0.99 (0.82, 1.19)
Conduct	518	1.22 (1.00, 1.48)	492	1.58 (1.07, 2.33)	1010	1.29 (1.08, 1.54)
Hyperactivity	516	1.22 (0.91, 1.65)	492	1.40 (0.86, 2.29)	1008	1.27 (0.98, 1.65)
Peer	517	1.07 (0.93, 1.24)	492	1.30 (0.96, 1.78)	1009	1.11 (0.98, 1.26)
Prosocial	517	1.16 (0.97, 1.39)	492	0.96 (0.67, 1.38)	1009	1.12 (0.95, 1.31)
<b>Postnatal <i>p,p'</i>-DDE</b>						
Total difficulties	482	0.84 (0.68, 1.02)	485	1.00 (0.76, 1.33)	967	0.89 (0.76, 1.05)
Emotional	484	0.91 (0.76, 1.08)	485	0.96 (0.73, 1.28)	969	0.92 (0.80, 1.07)
Conduct	484	1.00 (0.85, 1.17)	485	1.04 (0.83, 1.32)	969	1.01 (0.88, 1.16)
Hyperactivity	482	0.89 (0.70, 1.13)	485	0.85 (0.64, 1.12)	967	0.87 (0.73, 1.04)
Peer	483	1.01 (0.89, 1.14)	485	1.19 (0.98, 1.44)	968	1.06 (0.96, 1.18)
Prosocial	483	1.17 (0.98, 1.38)	485	0.95 (0.78, 1.17)	968	1.08 (0.95, 1.23)

Abbreviations: PCB-153, 2,2',4,4',5,5'-hexachlorobiphenyl; CI, confidence interval; DDE, dichlorodiphenyldichloroethylene; OR, odds ratio; PCB, polychlorinated biphenyls; *p,p'*-DDE, 1,1-dichloro-2,2-bis(*p*-chlorophenyl)-ethylene; SDQ, Strengths and Difficulties Questionnaire.

<sup>a</sup> Total difficulties score: abnormal  $\geq 17$ ; Emotional Symptoms Score: abnormal  $\geq 5$ ; Conduct Problems Score: abnormal  $\geq 4$ ; Hyperactivity Score: abnormal  $\geq 7$ ; Peer Problems Score: abnormal  $\geq 4$ ; Prosocial Behavior Score: abnormal  $\leq 4$ .

<sup>b</sup> Adjusted OR for the pooled cohort is adjusted for country.

**Table S2.** Adjusted<sup>a</sup> odds ratios (95% CI) for abnormal<sup>b</sup> SDQ scores associated with a doubling of PCB-153 and *p,p'*-DDE exposures from primary single-pollutant models and mutually-adjusted two-pollutant models.

Outcome	Greenland		Ukraine		Pooled <sup>c</sup>	
	Single-pollutant	Two-pollutant	Single-pollutant	Two-pollutant	Single-pollutant	Two-pollutant
<b>Prenatal PCB-153</b>						
Total difficulties	1.02 (0.77, 1.36)	0.78 (0.41, 1.46)	1.24 (0.77, 1.99)	1.11 (0.66, 1.85)	1.09 (0.86, 1.38)	0.97 (0.67, 1.39)
Emotional	0.88 (0.70, 1.11)	0.73 (0.44, 1.22)	1.16 (0.71, 1.90)	1.09 (0.64, 1.87)	0.94 (0.76, 1.15)	0.89 (0.63, 1.27)
Conduct	1.18 (0.96, 1.46)	0.87 (0.54, 1.41)	1.32 (0.89, 1.96)	1.16 (0.76, 1.78)	1.19 (0.99, 1.42)	1.00 (0.74, 1.34)
Hyperactivity	1.35 (0.96, 1.89)	1.17 (0.54, 2.57)	0.96 (0.60, 1.53)	0.83 (0.50, 1.38)	1.24 (0.94, 1.62)	0.93 (0.62, 1.38)
Peer	1.04 (0.88, 1.22)	0.75 (0.52, 1.10)	1.19 (0.88, 1.61)	1.09 (0.78, 1.51)	1.05 (0.92, 1.21)	0.91 (0.73, 1.15)
Prosocial	1.17 (0.94, 1.45)	0.81 (0.49, 1.34)	0.83 (0.59, 1.16)	0.80 (0.55, 1.16)	1.06 (0.89, 1.26)	0.87 (0.66, 1.15)
<b>Postnatal PCB-153</b>						
Total difficulties	0.90 (0.65, 1.25)	0.54 (0.25, 1.18)	1.30 (0.81, 2.10)	1.11 (0.65, 1.91)	1.06 (0.82, 1.38)	0.90 (0.61, 1.33)
Emotional	0.87 (0.67, 1.12)	0.67 (0.39, 1.14)	1.16 (0.70, 1.91)	0.94 (0.57, 1.56)	0.94 (0.75, 1.17)	0.84 (0.59, 1.19)
Conduct	1.14 (0.91, 1.42)	0.81 (0.51, 1.29)	1.24 (0.84, 1.83)	0.91 (0.61, 1.34)	1.16 (0.96, 1.41)	0.90 (0.68, 1.20)
Hyperactivity	1.05 (0.72, 1.53)	0.86 (0.42, 1.75)	1.03 (0.64, 1.66)	0.70 (0.44, 1.11)	1.08 (0.81, 1.45)	0.75 (0.50, 1.11)
Peer	1.03 (0.86, 1.22)	0.75 (0.51, 1.10)	1.51 (1.11, 2.04)	1.03 (0.76, 1.39)	1.12 (0.97, 1.30)	0.92 (0.73, 1.15)
Prosocial	1.16 (0.92, 1.45)	0.78 (0.47, 1.31)	0.88 (0.64, 1.22)	0.84 (0.59, 1.18)	1.06 (0.89, 1.28)	0.86 (0.65, 1.13)
<b>Prenatal <i>p,p'</i>-DDE</b>						
Total difficulties	1.09 (0.82, 1.45)	1.37 (0.71, 2.64)	1.46 (0.87, 2.44)	1.40 (0.80, 2.44)	1.15 (0.90, 1.48)	1.18 (0.81, 1.74)
Emotional	0.94 (0.76, 1.17)	1.22 (0.74, 1.99)	1.24 (0.71, 2.15)	1.19 (0.66, 2.17)	0.97 (0.79, 1.19)	1.06 (0.75, 1.50)
Conduct	1.24 (1.00, 1.54)	1.41 (0.86, 2.33)	1.58 (1.02, 2.44)	1.49 (0.93, 2.39)	1.25 (1.04, 1.51)	1.25 (0.92, 1.70)
Hyperactivity	1.36 (0.95, 1.94)	1.17 (0.52, 2.62)	1.42 (0.84, 2.40)	1.53 (0.88, 2.66)	1.43 (1.06, 1.92)	1.51 (0.99, 2.32)
Peer	1.11 (0.94, 1.30)	1.43 (0.97, 2.09)	1.36 (0.96, 1.91)	1.31 (0.90, 1.90)	1.12 (0.97, 1.29)	1.20 (0.95, 1.52)
Prosocial	1.24 (1.00, 1.54)	1.50 (0.89, 2.53)	0.99 (0.66, 1.47)	1.09 (0.71, 1.68)	1.16 (0.97, 1.39)	1.30 (0.98, 1.73)
<b>Postnatal <i>p,p'</i>-DDE</b>						
Total difficulties	1.02 (0.74, 1.41)	1.79 (0.78, 4.08)	1.51 (0.93, 2.45)	1.44 (0.84, 2.48)	1.16 (0.88, 1.52)	1.25 (0.83, 1.87)
Emotional	0.97 (0.76, 1.23)	1.32 (0.79, 2.23)	1.23 (0.73, 2.08)	1.02 (0.60, 1.71)	1.00 (0.80, 1.25)	1.09 (0.77, 1.53)
Conduct	1.21 (0.96, 1.52)	1.25 (0.79, 1.99)	1.42 (0.93, 2.18)	1.05 (0.70, 1.58)	1.24 (1.01, 1.51)	1.10 (0.82, 1.46)
Hyperactivity	1.11 (0.76, 1.60)	0.99 (0.50, 1.96)	1.50 (0.90, 2.52)	1.10 (0.68, 1.79)	1.27 (0.93, 1.73)	1.11 (0.75, 1.64)
Peer	1.10 (0.93, 1.31)	1.37 (0.94, 2.00)	1.79 (1.28, 2.50)	1.18 (0.85, 1.62)	1.20 (1.03, 1.40)	1.17 (0.93, 1.47)
Prosocial	1.28 (1.01, 1.61)	1.57 (0.93, 2.64)	1.03 (0.70, 1.49)	1.12 (0.78, 1.60)	1.20 (0.99, 1.45)	1.27 (0.97, 1.68)

Abbreviations: PCB-153, 2,2',4,4',5,5'-hexachlorobiphenyl; CI, confidence interval; DDE, dichlorodiphenyldichloroethylene; OR, odds ratio; PCB, polychlorinated biphenyls; *p,p'*-DDE, 1,1-dichloro-2,2-bis(*p*-chlorophenyl)-ethylene; SDQ, Strengths and Difficulties Questionnaire.

<sup>a</sup> Adjusted for maternal age, maternal smoking during pregnancy, child's sex, and child's age at follow-up. Estimated postnatal PCB-153 and *p,p'*-DDE are additionally adjusted for breastfeeding duration.

<sup>b</sup> Total difficulties score: abnormal  $\geq 17$ ; Emotional Symptoms Score: abnormal  $\geq 5$ ; Conduct Problems Score: abnormal  $\geq 4$ ; Hyperactivity Score: abnormal  $\geq 7$ ; Peer Problems Score: abnormal  $\geq 4$ ; Prosocial Behavior Score: abnormal  $\leq 4$ .

<sup>c</sup> Adjusted OR for the pooled cohort is adjusted for country.

**Table S3.** Adjusting for breastfeeding: Adjusted<sup>a</sup> odds ratios (95% CI) for abnormal<sup>b</sup> SDQ subscale scores associated with a doubling of prenatal PCB-153 and *p,p'*-DDE.

Outcome	Greenland				Ukraine				Pooled <sup>c</sup>			
	n total / n cases	Primary model	n total / n cases	Adjusted for breastfeeding	n total / n cases	Primary model	n total / n cases	Adjusted for breastfeeding	n total / n cases	Primary model	n total / n cases	Adjusted for breastfeeding
<b>PCB-153</b>												
Total difficulties	452 / 26	1.02 (0.77, 1.36)	412 / 19	0.86 (0.61, 1.20)	456 / 25	1.24 (0.77, 1.99)	453 / 25	1.25 (0.76, 2.03)	908 / 51	1.09 (0.86, 1.38)	865 / 44	1.01 (0.78, 1.31)
Emotional	454 / 37	0.88 (0.70, 1.11)	414 / 31	0.87 (0.67, 1.14)	456 / 23	1.16 (0.71, 1.90)	453 / 23	1.15 (0.69, 1.94)	910 / 60	0.94 (0.76, 1.15)	867 / 54	0.95 (0.76, 1.20)
Conduct	454 / 54	1.18 (0.96, 1.46)	414 / 46	1.11 (0.88, 1.40)	456 / 37	1.32 (0.89, 1.96)	453 / 37	1.32 (0.88, 2.00)	910 / 91	1.19 (0.99, 1.42)	867 / 83	1.14 (0.94, 1.38)
Hyperactivity	452 / 19	1.35 (0.96, 1.89)	412 / 15	1.06 (0.72, 1.55)	456 / 22	0.96 (0.60, 1.53)	453 / 22	0.90 (0.56, 1.44)	908 / 41	1.24 (0.94, 1.62)	865 / 37	1.04 (0.78, 1.39)
Peer	453 / 92	1.04 (0.88, 1.22)	413 / 81	1.00 (0.84, 1.19)	456 / 66	1.19 (0.88, 1.61)	453 / 66	1.19 (0.88, 1.61)	909 / 158	1.05 (0.92, 1.21)	866 / 147	1.03 (0.89, 1.19)
Prosocial	453 / 51	1.17 (0.94, 1.45)	413 / 43	1.11 (0.88, 1.39)	456 / 47	0.83 (0.59, 1.16)	453 / 47	0.82 (0.58, 1.15)	908 / 98	1.06 (0.89, 1.26)	866 / 90	1.01 (0.84, 1.21)
<b><i>p,p'</i>-DDE</b>												
Total difficulties	452 / 26	1.09 (0.82, 1.45)	412 / 19	0.98 (0.71, 1.37)	456 / 25	1.46 (0.87, 2.44)	453 / 25	1.43 (0.86, 2.37)	908 / 51	1.15 (0.90, 1.48)	865 / 44	1.09 (0.83, 1.43)
Emotional	454 / 37	0.94 (0.76, 1.17)	414 / 31	0.98 (0.76, 1.25)	456 / 23	1.24 (0.71, 2.15)	453 / 23	1.20 (0.69, 2.09)	910 / 60	0.97 (0.79, 1.19)	867 / 54	1.01 (0.81, 1.27)
Conduct	454 / 54	1.24 (1.00, 1.54)	414 / 46	1.19 (0.94, 1.49)	456 / 37	1.58 (1.02, 2.44)	453 / 37	1.54 (0.98, 2.41)	910 / 91	1.25 (1.04, 1.51)	867 / 83	1.20 (0.99, 1.47)
Hyperactivity	452 / 19	1.36 (0.95, 1.94)	412 / 15	1.11 (0.76, 1.63)	456 / 22	1.42 (0.84, 2.40)	453 / 22	1.35 (0.80, 2.30)	908 / 41	1.43 (1.06, 1.92)	865 / 37	1.23 (0.91, 1.67)
Peer	453 / 92	1.11 (0.94, 1.30)	413 / 81	1.08 (0.91, 1.28)	456 / 66	1.36 (0.96, 1.91)	453 / 66	1.37 (0.97, 1.93)	909 / 158	1.12 (0.97, 1.29)	866 / 147	1.10 (0.95, 1.28)
Prosocial	453 / 51	1.24 (1.00, 1.54)	413 / 43	1.22 (0.96, 1.55)	456 / 47	0.99 (0.66, 1.47)	453 / 47	0.98 (0.66, 1.46)	908 / 98	1.16 (0.97, 1.39)	866 / 90	1.14 (0.94, 1.39)

Abbreviations: PCB-153, 2,2',4,4',5,5'-hexachlorobiphenyl; CI, confidence interval; DDE, dichlorodiphenyldichloroethylene; OR, odds ratio; PCB, polychlorinated biphenyls; *p,p'*-DDE, 1,1-dichloro-2,2-bis(*p*-chlorophenyl)-ethylene; SDQ, Strengths and Difficulties Questionnaire.

<sup>a</sup> Adjusted for maternal age, maternal smoking during pregnancy, child's sex, and child's age at follow-up.

<sup>b</sup> Emotional Symptoms Score: abnormal  $\geq 5$ ; Conduct Problems Score: abnormal  $\geq 4$ ; Hyperactivity Score: abnormal  $\geq 7$ ; Peer Problems Score: abnormal  $\geq 4$ ; Prosocial Behavior Score: abnormal  $\leq 4$ .

<sup>c</sup> Adjusted OR for the pooled cohort is adjusted for country.

**Table S4.** Adjusted<sup>a</sup> odds ratios (95% CI) for top 10 percentile cut-off model and primary model of total difficulties scores associated with a doubling of prenatal and postnatal PCB-153 and *p,p'*-DDE.

	<b>Greenland</b>				<b>Ukraine</b>				<b>Pooled<sup>b</sup></b>			
	n total / n cases	Primary model	n total / n cases	10 percentile model <sup>b</sup>	n total / n cases	Primary model	n total / n cases	10 percentile model <sup>b</sup>	n total / n cases	Primary model	n total / n cases	10 percentile model <sup>b</sup>
Prenatal PCB-153	452 / 26	1.02 (0.77, 1.36)	442 / 43	1.12 (0.90, 1.41)	456 / 25	1.24 (0.77, 1.99)	456 / 45	1.02 (0.72, 1.43)	908 / 51	1.09 (0.86, 1.38)	898 / 88	1.10 (0.91, 1.32)
Estimated postnatal PCB-153	412 / 19	0.90 (0.65, 1.25)	417 / 34	1.05 (0.81, 1.36)	449 / 24	1.30 (0.81, 2.10)	450 / 44	1.10 (0.78, 1.55)	861 / 43	1.06 (0.82, 1.38)	867 / 78	1.09 (0.89, 1.33)
Prenatal <i>p,p'</i> -DDE	452 / 26	1.09 (0.82, 1.45)	442 / 43	1.20 (0.95, 1.52)	456 / 25	1.46 (0.87, 2.44)	456 / 45	1.06 (0.70, 1.58)	908 / 51	1.15 (0.90, 1.48)	898 / 88	1.16 (0.95, 1.40)
Estimated postnatal <i>p,p'</i> -DDE	412 / 19	1.02 (0.74, 1.41)	417 / 34	1.18 (0.91, 1.54)	449 / 24	1.51 (0.93, 2.45)	450 / 44	1.19 (0.81, 1.74)	861 / 43	1.16 (0.88, 1.52)	867 / 78	1.19 (0.96, 1.47)

Abbreviations: PCB-153, 2,2',4,4',5,5'-hexachlorobiphenyl; CI, confidence interval; DDE, dichlorodiphenyldichloroethylene; OR, odds ratio; PCB, polychlorinated biphenyls; *p,p'*-DDE, 1,1-dichloro-2,2-bis(*p*-chlorophenyl)-ethylene; SDQ, Strengths and Difficulties Questionnaire.

<sup>a</sup> Adjusted for maternal age, maternal smoking during pregnancy, child's sex, and child's age at follow-up. Estimated postnatal PCB-153 and *p,p'*-DDE are additionally adjusted for breastfeeding duration.

<sup>b</sup> Crude and adjusted OR for the pooled cohort is adjusted for country.

**Table S5.** Pooled analysis including Poland: Odds ratios (95% CI) for abnormal<sup>a</sup> total difficulties scores associated with a doubling of prenatal and postnatal PCB-153 and *p,p'*-DDE.

	<b>Pooled<sup>a</sup></b>		n total	Adjusted OR <sup>c</sup>
	n total	Crude OR		
Prenatal PCB-153	1098	1.06 (0.86, 1.31)	994	1.15 (0.92, 1.45)
Prenatal <i>p,p'</i> -DDE	1098	1.11 (0.89, 1.38)	994	1.17 (0.92, 1.50)
Estimated postnatal PCB-153	1036	0.87 (0.74, 1.03)	927	1.15 (0.89, 1.49)
Estimated postnatal <i>p,p'</i> -DDE	1036	0.90 (0.76, 1.05)	927	1.20 (0.92, 1.57)

Abbreviations: PCB-153, 2,2',4,4',5,5'-hexachlorobiphenyl; CI, confidence interval; DDE, dichlorodiphenyldichloroethylene; OR, odds ratio; PCB, polychlorinated biphenyls; *p,p'*-DDE, 1,1-dichloro-2,2-bis(*p*-chlorophenyl)-ethylene; SDQ, Strengths and Difficulties Questionnaire.

<sup>a</sup> Total difficulties Score: abnormal  $\geq 17$ .

<sup>b</sup> Crude and adjusted OR for the pooled cohort is adjusted for country.

<sup>c</sup> Adjusted for maternal age, maternal smoking during pregnancy, child's sex, and child's age at follow-up. Estimated postnatal PCB-153 and *p,p'*-DDE are additionally adjusted for breastfeeding duration.