| Item | Page number |
| --- | --- |
| Table of contents |  |
| Appendix 1: Further details on our use of multiple imputation by chained equations. |  |
| Table S1. Comparison of study and full sample's sociodemographic characteristics, MIREC study, Canada, 2008-11. |  |
| Table S2. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation, including weights, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S3. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by child sex, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S4. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by gestational folic acid supplementation, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S5. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by plasma total folate concentrations, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S6. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using weighted quantile sum regression, including weighted quantile sum weights, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S7. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by plasma unmetabolized folic acid concentrations, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S8. Adjustedᵃ associations (additionally controlling for gestational fish consumption) between chemical mixtures and SRS-2 T-scores using quantile g-computation, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S9. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation without inverse probability weighting, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S10. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by gestational folic acid supplementation without inverse probability weighting, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Table S11. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by plasma total folate concentrations without inverse probability weighting, the MIREC study, Canada, 2008-2011 (n = 601). |  |
| Figure S1. Flow chart of study participants in sample, the MIREC Study, Canada, 2008-11. |  |
| Figure S2. Directed acyclic graph depicting our assumptions about the relationship between gestational environmental chemical mixtures and autistic behaviors. |  |
| References |  |

| Table S2. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation, including weights, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | |
| --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | OC Pesticides | PFAS | PCBs | All POPs |
| Ψ (95% CI)ᵃ | 0.4 (-0.4, 1.2) | 0.0 (-0.6, 0.7) | -0.5 (-1.1, 0.1) | 0.4 (-0.2, 0.9) | 0.1 (-0.9, 1.0) |
| Biomarker names | Weightsᵇ | | | | |
| Arsenic | -0.08 |  |  |  |  |
| Cadmium | 0.25 |  |  |  |  |
| Lead | 0.75 |  |  |  |  |
| Mercury | -0.92 |  |  |  |  |
| β-HCH |  | -0.32 |  |  | -0.07 |
| DDE |  | 1 |  |  | -0.05 |
| Oxychlordane |  | -0.41 |  |  | -0.08 |
| trans-Nonachlor |  | -0.27 |  |  | -0.15 |
| PFHxS |  |  | 1 |  | 0.23 |
| PFOS |  |  | -0.7 |  | -0.34 |
| PFOA |  |  | -0.3 |  | -0.15 |
| PCB118 |  |  |  | -0.47 | -0.03 |
| PCB138 |  |  |  | 0.46 | 0.27 |
| PCB153 |  |  |  | 0.54 | 0.3 |
| PCB180 |  |  |  | -0.53 | -0.12 |
| BDE47 |  |  |  |  | 0.21 |
| a: Controls for the following variables: child sex, gestational folic acid supplementation, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are applied. b: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane. | | | | | |

| Table S3. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by child sex, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | | OC Pesticides | | PFAS | | PCBs | | All POPs | |
| Child sex | Male | Female | Male | Female | Male | Female | Male | Female | Male | Female |
| Ψ (95% CI)ᵃ | 0.8 (-0.2, 1.8) | 0.0 (-1.1, 1.1) | -0.1 (-0.9, 0.8) | 0.1 (-0.8, 1.0) | -0.7 (-1.4, 0.0) | -0.2 (-1.1, 0.6) | 0.3 (-0.4, 1.0) | 0.4 (-0.4, 1.1) | 0.1 (-1.1, 1.4) | 0.0 (-1.5, 1.6) |
| Biomarker names | Weightsᵇ | | | | | | | | | |
| Arsenic | 0.11 | -0.23 |  |  |  |  |  |  |  |  |
| Cadmium | 0.07 | 0.53 |  |  |  |  |  |  |  |  |
| Lead | 0.78 | 0.47 |  |  |  |  |  |  |  |  |
| Mercury | 0.04 | -0.77 |  |  |  |  |  |  |  |  |
| β-HCH |  |  | -0.07 | -0.25 |  |  |  |  | -0.03 | -0.11 |
| DDE |  |  | 1 | -0.75 |  |  |  |  | 0.13 | -0.34 |
| Oxychlordane |  |  | -0.21 | 0.2 |  |  |  |  | -0.06 | 0.06 |
| trans-Nonachlor |  |  | -0.72 | 0.8 |  |  |  |  | -0.38 | 0.23 |
| PFHxS |  |  |  |  | 1 | 1 |  |  | 0.14 | 0.2 |
| PFOS |  |  |  |  | -0.68 | -0.75 |  |  | -0.19 | -0.28 |
| PFOA |  |  |  |  | -0.32 | -0.25 |  |  | -0.13 | -0.05 |
| PCB118 |  |  |  |  |  |  | -0.26 | -0.56 | 0.06 | -0.1 |
| PCB138 |  |  |  |  |  |  | 0.26 | 0.61 | 0.04 | 0.43 |
| PCB153 |  |  |  |  |  |  | 0.74 | -0.44 | 0.43 | -0.12 |
| PCB180 |  |  |  |  |  |  | -0.74 | 0.39 | -0.21 | 0.01 |
| BDE47 |  |  |  |  |  |  |  |  | 0.21 | 0.08 |
| a: Controls for the following variables: gestational folic acid supplementation, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are applied. b: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane. | | | | | | | | | | |

| Table S4. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by gestational folic acid supplementation, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | | | OC Pesticides | | | PFAS | | | PCBs | | | All POPs | | |
| FA supplementationᵇ (µg/day) | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 |
| Ψ (95% CI)ᵃ | 0.6 (-1.6, 2.8) | -0.2 (-1.1, 0.7) | 2.4 (0.8, 3.9) | 1.3 (-0.8, 3.3) | -0.3 (-1.1, 0.5) | 0.6 (-0.7, 1.8) | 1.4 (-0.8, 3.6) | -0.8 (-1.4, -0.1) | -0.3 (-1.3, 0.8) | 1.9 (0.0, 3.8) | -0.1 (-0.8, 0.6) | 1.0 (0.0, 2.0) | 2.9 (-0.8, 6.6) | -0.6 (-1.8, 0.5) | 0.7 (-1.4, 2.7) |
| Biomarker names | Weightsᶜ | | | | | | | | | | | | | | |
| Arsenic | 0.4 | -0.35 | 0.17 |  |  |  |  |  |  |  |  |  |  |  |  |
| Cadmium | -0.55 | 0.47 | 0.08 |  |  |  |  |  |  |  |  |  |  |  |  |
| Lead | 0.6 | 0.53 | 0.42 |  |  |  |  |  |  |  |  |  |  |  |  |
| Mercury | -0.45 | -0.65 | 0.33 |  |  |  |  |  |  |  |  |  |  |  |  |
| β-HCH |  |  |  | -0.19 | -0.39 | 0.28 |  |  |  |  |  |  | 0.01 | -0.03 | -0.09 |
| DDE |  |  |  | 0.82 | -0.05 | 0.69 |  |  |  |  |  |  | -0.12 | -0.08 | -0.04 |
| Oxychlordane |  |  |  | 0.18 | -0.56 | 0.03 |  |  |  |  |  |  | -0.12 | -0.06 | 0.01 |
| trans-Nonachlor |  |  |  | -0.81 | 1 | -1 |  |  |  |  |  |  | -0.22 | 0.03 | -0.22 |
| PFHxS |  |  |  |  |  |  | -0.27 | 1 | 0.47 |  |  |  | -0.11 | 0.28 | 0.1 |
| PFOS |  |  |  |  |  |  | 1 | -0.77 | -1 |  |  |  | 0.17 | -0.37 | -0.19 |
| PFOA |  |  |  |  |  |  | -0.73 | -0.23 | 0.53 |  |  |  | 0 | -0.11 | -0.01 |
| PCB118 |  |  |  |  |  |  |  |  |  | 0.12 | -0.62 | 0.19 | 0.1 | -0.17 | 0.16 |
| PCB138 |  |  |  |  |  |  |  |  |  | -0.44 | 1 | -0.55 | -0.4 | 0.55 | -0.21 |
| PCB153 |  |  |  |  |  |  |  |  |  | 0.88 | -0.36 | 0.81 | 0.55 | -0.13 | 0.62 |
| PCB180 |  |  |  |  |  |  |  |  |  | -0.56 | -0.02 | -0.45 | -0.03 | -0.05 | -0.25 |
| BDE47 |  |  |  |  |  |  |  |  |  |  |  |  | 0.17 | 0.14 | 0.1 |
| a: Controls for the following variables: child sex, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are applied. b: Folic acid supplementation was primarily measured via a survey conducted at 16 weeks gestation, which queried intake in the past 30 days. We also used data from the 24-hour recall version of this survey and a questionnaire completed at study enrollment (6-13 weeks gestation). c: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane. | | | | | | | | | | | | | | | |

| Table S5. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by plasma total folate concentrations, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | | | OC Pesticides | | | PFAS | | | PCBs | | | All POPs | | |
| Plasma total folate concentrationᵇ | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile |
| Ψ (95% CI)ᵃ | -0.1 (-3.1, 2.8) | -0.1 (-1.0, 0.8) | 1.9 (0.4, 3.3) | 0.2 (-1.7, 2.1) | 0.0 (-0.8, 0.7) | 0.4 (-0.9, 1.7) | -0.5 (-2.4, 1.5) | -0.3 (-0.9, 0.4) | -1.5 (-2.6, -0.3) | 0.4 (-1.4, 2.2) | 0.4 (-0.2, 1.0) | 0.3 (-0.9, 1.5) | 1.1 (-1.7, 4.0) | 0.2 (-0.9, 1.4) | -1.9 (-4.3, 0.6) |
| Biomarker names | Weightsᶜ | | | | | | | | | | | | | | |
| Arsenic | 0.02 | -0.15 | -1 |  |  |  |  |  |  |  |  |  |  |  |  |
| Cadmium | -0.4 | -0.06 | 0.5 |  |  |  |  |  |  |  |  |  |  |  |  |
| Lead | 0.98 | 1 | 0.42 |  |  |  |  |  |  |  |  |  |  |  |  |
| Mercury | -0.6 | -0.79 | 0.07 |  |  |  |  |  |  |  |  |  |  |  |  |
| β-HCH |  |  |  | -0.18 | -0.29 | 0.29 |  |  |  |  |  |  | -0.08 | -0.12 | 0.04 |
| DDE |  |  |  | 0.25 | 1 | -1 |  |  |  |  |  |  | -0.05 | -0.01 | -0.21 |
| Oxychlordane |  |  |  | -0.82 | -0.14 | 0.71 |  |  |  |  |  |  | -0.51 | -0.11 | 0.31 |
| trans-Nonachlor |  |  |  | 0.75 | -0.57 | 0 |  |  |  |  |  |  | 0.4 | -0.28 | -0.04 |
| PFHxS |  |  |  |  |  |  | -1 | 1 | 1 |  |  |  | -0.19 | 0.33 | 0.19 |
| PFOS |  |  |  |  |  |  | 0.97 | -0.74 | -0.87 |  |  |  | 0.04 | -0.32 | -0.36 |
| PFOA |  |  |  |  |  |  | 0.03 | -0.26 | -0.13 |  |  |  | 0.04 | -0.11 | -0.08 |
| PCB118 |  |  |  |  |  |  |  |  |  | -0.35 | -0.53 | 0.24 | -0.16 | -0.05 | 0.26 |
| PCB138 |  |  |  |  |  |  |  |  |  | -0.42 | 0.87 | 0.29 | 0.08 | 0.43 | 0.13 |
| PCB153 |  |  |  |  |  |  |  |  |  | 1 | 0.13 | 0.47 | 0.2 | 0.07 | 0.07 |
| PCB180 |  |  |  |  |  |  |  |  |  | -0.23 | -0.47 | -1 | 0 | 0 | -0.19 |
| BDE47 |  |  |  |  |  |  |  |  |  |  |  |  | 0.24 | 0.18 | -0.12 |
| a: Controls for the following variables: child sex, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are applied. b: The sum of 5-formyl-THF, 5-10-methylene-THF, THF, UMFA, and 5-methyl-THF. c: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; THF, Tetrahydrofolate; UMFA, Unmetabolized folic acid; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane; %ile, Percentile. | | | | | | | | | | | | | | | |

| Table S6. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using weighted quantile sum regression, including weighted quantile sum weights, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | | OC Pesticides | | PFAS | | PCBs | | All POPs | |
| Partial effect | (+) | (-) | (+) | (-) | (+) | (-) | (+) | (-) | (+) | (-) |
| β (95% CI)ᵃ | 0.5 (-0.2, 1.2) | 0.6 (-0.2, 1.4) | 0.3 (-0.5, 1.1) | 0.4 (-0.4, 1.2) | -0.5 (-1.1, 0.0) | -1.0 (-1.7, -0.3) | 0.8 (0.1, 1.4) | 0.8 (0.2, 1.5) | -0.1 (-1.0, 0.9) | 0.3 (-0.7, 1.3) |
| Biomarker names | Weightsᵇ | | | | | | | | | |
| Arsenic | 0.02 | 0.36 |  |  |  |  |  |  |  |  |
| Cadmium | 0.72 | 0.05 |  |  |  |  |  |  |  |  |
| Lead | 0.25 | 0.11 |  |  |  |  |  |  |  |  |
| Mercury | 0.01 | 0.47 |  |  |  |  |  |  |  |  |
| β-HCH |  |  | 0.14 | 0.42 |  |  |  |  | 0.01 | 0.25 |
| DDE |  |  | 0.25 | 0.16 |  |  |  |  | 0.01 | 0.07 |
| Oxychlordane |  |  | 0.06 | 0.38 |  |  |  |  | 0 | 0.16 |
| trans-Nonachlor |  |  | 0.55 | 0.04 |  |  |  |  | 0.03 | 0.01 |
| PFHxS |  |  |  |  | 0.96 | 0 |  |  | 0.44 | 0 |
| PFOS |  |  |  |  | 0.01 | 0.6 |  |  | 0 | 0.13 |
| PFOA |  |  |  |  | 0.04 | 0.4 |  |  | 0.01 | 0.11 |
| PCB118 |  |  |  |  |  |  | 0.24 | 0.41 | 0.01 | 0.1 |
| PCB138 |  |  |  |  |  |  | 0.03 | 0.34 | 0 | 0.06 |
| PCB153 |  |  |  |  |  |  | 0.48 | 0.02 | 0.04 | 0 |
| PCB180 |  |  |  |  |  |  | 0.25 | 0.23 | 0.05 | 0.1 |
| BDE47 |  |  |  |  |  |  |  |  | 0.39 | 0 |
| a: Controls for the following variables: child sex, gestational folic acid supplementation, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are applied. b: Weights are averaged across 10 multiply imputed datasets. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane. | | | | | | | | | | |

| Table S7. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by plasma unmetabolized folic acid concentrations, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | | OC Pesticides | | PFAS | | PCBs | | All POPs | |
| Plasma unmetabolized folic acid concentrations | ≤80ᵗʰ %ile | >80ᵗʰ %ile | ≤80ᵗʰ %ile | >80ᵗʰ %ile | ≤80ᵗʰ %ile | >80ᵗʰ %ile | ≤80ᵗʰ %ile | >80ᵗʰ %ile | ≤80ᵗʰ %ile | >80ᵗʰ %ile |
| Ψ (95% CI)ᵃ | 0.2 (-0.7, 1.1) | 1.0 (-0.6, 2.6) | 0.0 (-0.7, 0.7) | 0.4 (-0.9, 1.7) | -0.3 (-0.9, 0.3) | -1.2 (-2.3, 0.0) | 0.4 (-0.2, 1.0) | 0.5 (-0.8, 1.7) | 0.3 (-0.8, 1.3) | -0.6 (-2.9, 1.7) |
| Biomarker names | Weightsᵇ | | | | | | | | | |
| Arsenic | -0.33 | 0.25 |  |  |  |  |  |  |  |  |
| Cadmium | 0.16 | 0.21 |  |  |  |  |  |  |  |  |
| Lead | 0.84 | 0.27 |  |  |  |  |  |  |  |  |
| Mercury | -0.67 | 0.27 |  |  |  |  |  |  |  |  |
| β-HCH |  |  | -0.45 | 0.23 |  |  |  |  | -0.14 | 0.12 |
| DDE |  |  | 0.86 | 0.36 |  |  |  |  | -0.09 | 0.08 |
| Oxychlordane |  |  | 0.14 | -1 |  |  |  |  | -0.01 | -0.25 |
| trans-Nonachlor |  |  | -0.55 | 0.41 |  |  |  |  | -0.28 | 0.11 |
| PFHxS |  |  |  |  | 1 | 1 |  |  | 0.25 | 0.16 |
| PFOS |  |  |  |  | -0.85 | -0.26 |  |  | -0.38 | -0.08 |
| PFOA |  |  |  |  | -0.15 | -0.74 |  |  | -0.05 | -0.32 |
| PCB118 |  |  |  |  |  |  | -0.54 | -0.47 | -0.04 | -0.03 |
| PCB138 |  |  |  |  |  |  | 0.25 | 0.73 | 0.14 | 0.31 |
| PCB153 |  |  |  |  |  |  | 0.75 | 0.27 | 0.32 | 0.22 |
| PCB180 |  |  |  |  |  |  | -0.46 | -0.53 | 0.01 | -0.27 |
| BDE47 |  |  |  |  |  |  |  |  | 0.28 | -0.05 |
| a: Controls for the following variables: child sex, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are applied. b: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane; %ile, Percentile. | | | | | | | | | | |

| Table S8. Adjustedᵃ associations (additionally controlling for gestational fish consumption) between chemical mixtures and SRS-2 T-scores using quantile g-computation, including quantile g-computation weights, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | |
| --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | OC Pesticides | PFAS | PCBs | All POPs |
| Ψ (95% CI)ᵃ | 0.3 (-0.5, 1.1) | 0.0 (-0.6, 0.7) | -0.5 (-1.1, 0.1) | 0.4 (-0.2, 1.0) | 0.1 (-0.9, 1.1) |
| Biomarker names | Weightsᵇ | | | | |
| Arsenic | -0.23 |  |  |  |  |
| Cadmium | 0.25 |  |  |  |  |
| Lead | 0.75 |  |  |  |  |
| Mercury | -0.77 |  |  |  |  |
| β-HCH |  | -0.32 |  |  | -0.07 |
| DDE |  | 1 |  |  | -0.05 |
| Oxychlordane |  | -0.4 |  |  | -0.07 |
| trans-Nonachlor |  | -0.28 |  |  | -0.17 |
| PFHxS |  |  | 1 |  | 0.22 |
| PFOS |  |  | -0.71 |  | -0.34 |
| PFOA |  |  | -0.29 |  | -0.15 |
| PCB118 |  |  |  | -0.47 | -0.03 |
| PCB138 |  |  |  | 0.46 | 0.27 |
| PCB153 |  |  |  | 0.54 | 0.3 |
| PCB180 |  |  |  | -0.53 | -0.12 |
| BDE47 |  |  |  |  | 0.21 |
| a: Controls for the following variables: gestational fish consumption, child sex, gestational folic acid supplementation, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are applied. b: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane. | | | | | |

| Table S9. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation without inverse probability weighting, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | |
| --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | OC Pesticides | PFAS | PCBs | All POPs |
| Ψ (95% CI)ᵃ | -0.1 (-0.8, 0.7) | -0.2 (-0.9, 0.4) | -0.6 (-1.2, 0.0) | 0.0 (-0.6, 0.6) | -0.5 (-1.5, 0.4) |
| Biomarker names | Weightsᵇ | | | | |
| Arsenic | -0.19 |  |  |  |  |
| Cadmium | 0.37 |  |  |  |  |
| Lead | 0.63 |  |  |  |  |
| Mercury | -0.81 |  |  |  |  |
| β-HCH |  | -0.5 |  |  | -0.12 |
| DDE |  | 0.7 |  |  | -0.07 |
| Oxychlordane |  | -0.5 |  |  | -0.08 |
| trans-Nonachlor |  | 0.3 |  |  | -0.07 |
| PFHxS |  |  | 1 |  | 0.29 |
| PFOS |  |  | -0.48 |  | -0.22 |
| PFOA |  |  | -0.52 |  | -0.21 |
| PCB118 |  |  |  | -0.57 | -0.08 |
| PCB138 |  |  |  | 0.66 | 0.38 |
| PCB153 |  |  |  | 0.34 | 0.19 |
| PCB180 |  |  |  | -0.43 | -0.15 |
| BDE47 |  |  |  |  | 0.15 |
| a: Controls for the following variables: child sex, gestational folic acid supplementation, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are not applied. b: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane. | | | | | |

| Table S10. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by gestational folic acid supplementation without inverse probability weighting, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | | | OC Pesticides | | | PFAS | | | PCBs | | | All POPs | | |
| FA supplementationᵇ (µg/day) | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 | <400 | 400-1000 | >1000 |
| Ψ (95% CI)ᵃ | -0.3 (-2.7, 2.0) | -0.6 (-1.4, 0.3) | 1.7 (0.1, 3.3) | 0.4 (-1.8, 2.7) | -0.5 (-1.3, 0.2) | 0.3 (-0.9, 1.6) | 0.4 (-1.9, 2.6) | -0.9 (-1.6, -0.2) | -0.2 (-1.3, 0.9) | 1.1 (-0.7, 3.0) | -0.2 (-0.9, 0.4) | 0.3 (-0.7, 1.4) | 2.1 (-2.2, 6.3) | -1.0 (-2.0, 0.1) | 0.0 (-2.1, 2.0) |
| Biomarker names | Weightsᶜ | | | | | | | | | | | | | | |
| Arsenic | 0.45 | -0.31 | 0.11 |  |  |  |  |  |  |  |  |  |  |  |  |
| Cadmium | -0.55 | 0.19 | 0.31 |  |  |  |  |  |  |  |  |  |  |  |  |
| Lead | 0.55 | 0.81 | 0.2 |  |  |  |  |  |  |  |  |  |  |  |  |
| Mercury | -0.45 | -0.69 | 0.38 |  |  |  |  |  |  |  |  |  |  |  |  |
| β-HCH |  |  |  | -0.09 | -0.54 | 0.01 |  |  |  |  |  |  | 0.06 | -0.1 | -0.02 |
| DDE |  |  |  | 0.78 | 1 | 0.12 |  |  |  |  |  |  | -0.17 | -0.04 | -0.02 |
| Oxychlordane |  |  |  | 0.22 | -0.24 | -1 |  |  |  |  |  |  | -0.1 | -0.02 | -0.21 |
| trans-Nonachlor |  |  |  | -0.91 | -0.22 | 0.87 |  |  |  |  |  |  | -0.17 | -0.11 | 0.24 |
| PFHxS |  |  |  |  |  |  | -0.59 | 1 | 1 |  |  |  | -0.17 | 0.35 | 0.11 |
| PFOS |  |  |  |  |  |  | 1 | -0.62 | -0.46 |  |  |  | 0.22 | -0.31 | -0.13 |
| PFOA |  |  |  |  |  |  | -0.41 | -0.38 | -0.54 |  |  |  | 0.01 | -0.16 | -0.12 |
| PCB118 |  |  |  |  |  |  |  |  |  | 0 | -0.67 | 0.08 | -0.03 | -0.12 | -0.01 |
| PCB138 |  |  |  |  |  |  |  |  |  | 0.52 | 1 | -0.58 | -0.04 | 0.53 | -0.2 |
| PCB153 |  |  |  |  |  |  |  |  |  | 0.48 | -0.12 | 0.92 | 0.55 | -0.04 | 0.6 |
| PCB180 |  |  |  |  |  |  |  |  |  | -1 | -0.21 | -0.42 | -0.31 | -0.09 | -0.29 |
| BDE47 |  |  |  |  |  |  |  |  |  |  |  |  | 0.16 | 0.12 | 0.05 |
| a: Controls for the following variables: child sex, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are not applied. b: Folic acid supplementation was primarily measured via a survey conducted at 16 weeks gestation, which queried intake in the past 30 days. We also used data from the 24-hour recall version of this survey and a questionnaire completed at study enrollment (6-13 weeks gestation). c: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane. | | | | | | | | | | | | | | | |

| Table S11. Adjustedᵃ associations between chemical mixtures and SRS-2 T-scores using quantile g-computation and assessing modification by plasma total folate concentrations without inverse probability weighting, the MIREC study, Canada, 2008-2011 (n = 601). | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mixture name | Metals | | | OC Pesticides | | | PFAS | | | PCBs | | | All POPs | | |
| Plasma total folate concentrationᵇ | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile | <10ᵗʰ %ile | 10ᵗʰ-80ᵗʰ %ile | >80ᵗʰ %ile |
| Ψ (95% CI)ᵃ | -0.7 (-3.2, 1.8) | -0.3 (-1.2, 0.6) | 1.1 (-0.3, 2.6) | 0.0 (-1.9, 1.9) | -0.3 (-1.0, 0.4) | 0.2 (-1.1, 1.5) | -1.0 (-2.8, 0.8) | -0.5 (-1.2, 0.1) | -1.3 (-2.6, 0.0) | 0.4 (-1.4, 2.1) | 0.0 (-0.7, 0.6) | 0.1 (-1.0, 1.2) | 0.2 (-2.4, 2.9) | -0.5 (-1.6, 0.7) | -1.6 (-4.0, 0.9) |
| Biomarker names | Weightsᶜ | | | | | | | | | | | | | | |
| Arsenic | 0.44 | -0.2 | -0.59 |  |  |  |  |  |  |  |  |  |  |  |  |
| Cadmium | -0.33 | 1 | 0.49 |  |  |  |  |  |  |  |  |  |  |  |  |
| Lead | 0.56 | -0.46 | 0.51 |  |  |  |  |  |  |  |  |  |  |  |  |
| Mercury | -0.67 | -0.34 | -0.41 |  |  |  |  |  |  |  |  |  |  |  |  |
| β-HCH |  |  |  | -0.24 | -0.6 | 0.75 |  |  |  |  |  |  | -0.07 | -0.15 | 0.28 |
| DDE |  |  |  | 0.22 | 1 | -0.73 |  |  |  |  |  |  | -0.12 | -0.02 | -0.18 |
| Oxychlordane |  |  |  | -0.76 | -0.12 | 0.25 |  |  |  |  |  |  | -0.36 | -0.03 | 0.02 |
| trans-Nonachlor |  |  |  | 0.78 | -0.28 | -0.27 |  |  |  |  |  |  | 0.3 | -0.16 | -0.02 |
| PFHxS |  |  |  |  |  |  | -0.47 | 1 | 1 |  |  |  | -0.18 | 0.32 | 0.16 |
| PFOS |  |  |  |  |  |  | 1 | -0.54 | -0.75 |  |  |  | 0.04 | -0.22 | -0.39 |
| PFOA |  |  |  |  |  |  | -0.53 | -0.46 | -0.25 |  |  |  | 0 | -0.16 | -0.15 |
| PCB118 |  |  |  |  |  |  |  |  |  | -0.5 | -0.57 | 0.67 | -0.21 | -0.11 | 0.19 |
| PCB138 |  |  |  |  |  |  |  |  |  | -0.25 | 0.8 | 0.33 | 0.1 | 0.49 | 0.31 |
| PCB153 |  |  |  |  |  |  |  |  |  | 1 | 0.2 | -0.74 | 0.34 | 0.12 | -0.06 |
| PCB180 |  |  |  |  |  |  |  |  |  | -0.25 | -0.43 | -0.26 | -0.07 | -0.16 | -0.2 |
| BDE47 |  |  |  |  |  |  |  |  |  |  |  |  | 0.22 | 0.07 | 0.05 |
| a: Controls for the following variables: child sex, child age at SRS-2 assessment, HOME score, household income, relationship status, maternal education, maternal race, maternal age, parity, smoking status, city of residence, and year of enrollment. Effect estimates are pooled across 10 multiply imputed datasets. Stabilized inverse probability weights are not applied. b: The sum of 5-formyl-THF, 5-10-methylene-THF, THF, UMFA, and 5-methyl-THF. c: Only the weights from the first MICE imputation, not the pooled weights, are displayed. Abbreviations: BDE, brominated diphenyl ether; CI; Confidence interval; DDE, Dichlorodiphenyldichloroethylene; HOME, Home Observation for Measurement of the Environment; MICE, Multiple imputation by chained equations; MIREC, Maternal-Infant Research on Environmental Chemicals Study; OC, Organochlorine; PCB, Polychlorinated biphenyl; PFAS, Per- and polyfluoroalkyl substances; PFHxS, Perfluorohexanesulfonic acid; PFOA, Perfluorooctanoic acid; PFOS, Perfluorooctanesulfonic acid; POP, Persistent organic pollutant; THF, Tetrahydrofolate; UMFA, Unmetabolized folic acid; SRS-2, Social Responsiveness Scale-2; β-HCH, β-Hexachlorocyclohexane; %ile, Percentile. | | | | | | | | | | | | | | | |