

Plasticizers may contribute to motor control problems in girls

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Scientists at the Columbia Center for Children's Environmental Health (CCCEH) have uncovered a link between prenatal exposure to phthalates—a ubiquitous group of plasticizers and odor-enhancing chemicals—and deficits in motor function in girls. Phthalates are widely used in consumer products from plastic toys to household building materials to shampoos and are thought to disrupt endocrine function, and

possibly interfere with brain development in utero.

Results of a longitudinal study of 209 New York City women and their offspring are published in the journal *Environment International*.

The researchers measured seven [phthalate](#) metabolites in maternal spot urine obtained during the third trimester of pregnancy. Motor function was evaluated at age 11. After adjusting for potential confounders, they saw a decrease in fine-motor functions among girls, not boys, following exposure to high levels of specific metabolites. Accounting for mixtures of phthalates and motor functions, the analysis pointed to three phthalates most linked to the deficits: mono-butyl phthalate (MBP), mono-benzyl phthalate (MBzP), and mono-isobutyl phthalate (MiBP)—none of which are metabolites of Di-2-ethylhexyl phthalates (DEHP), the most common category of phthalates.

"There a growing awareness of the problem of plastics, which are destructive to animal life and ecosystems," says senior author Pam Factor-Litvak, Ph.D., professor of epidemiology. "In this study, we have found new evidence that phthalates—chemicals commonly used in cosmetics and plastics—are harmful to children's health. Girls with deficits in fine motor skills may have difficulty with their schoolwork, particularly related to problems writing and using electronic devices. They may also have problems with hand-eye coordination."

Phthalates are easily unbound from plastics and released into the environment; most exposure is from diet (where they are part of food packaging), air (as they are used in air fresheners, perfumes, etc.), and skin absorption (as they are used in personal care products). Phthalates cross the blood-placenta barrier and are associated with shortened gestational age, disrupted male reproductive development, and deficits in cognitive function and behavioral outcomes.

Phthalates were previously shown to alter the levels of thyroid hormones, which are critical for [brain development](#), especially the development of the cerebellum, which is in part accountable for coordination and fine-motor movements. Phthalates were also shown to disrupt specialized neurons associated with the development of motor skills, including [fine motor skills](#), which are known to develop earlier in girls than in boys.

More information: Sharon Daniel et al, Perinatal phthalates exposure decreases fine-motor functions in 11-year-old girls: Results from weighted Quantile sum regression, *Environment International* (2019). [DOI: 10.1016/j.envint.2019.105424](https://doi.org/10.1016/j.envint.2019.105424)

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