

Study finds lead negatively impacts cognitive functions of boys more than girls

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A study recently published in the *Journal of Environmental Health* provides evidence the female hormones estrogen and estradiol may help ward off the effects of lead exposure for young girls, explaining why boys, in greater numbers than girls, are shown to suffer from the cognitive disabilities linked to lead.

"The study supports existing research suggesting that estrogen and estradiol in females may act as neuroprotectants against the negative impacts of neurotoxins," said Maya Khanna, Ph.D., a psychology professor in Creighton University's College of Arts and Sciences. "The findings also add to the evidence that [lead exposure](#) has a [negative impact](#) on cognitive functioning, especially those functions housed within frontal areas of the brain. Executive functions are controlled largely by the [prefrontal cortex](#), while reading skills rely more heavily on the temporal or parietal areas of the cerebral cortex."

Khanna conducted the study, testing executive function and reading readiness skills of 40 young children, ages 3 to 6, living within the Environmental Protection Agency-designated Omaha Lead Superfund Site. The site is the largest residential lead clean-up area in the nation and has significant lead contamination in surface soils due to emissions of a lead refinery that operated in the area for 125 years. Additionally, many homes within the area are relatively old and still contain lead-based paint.

Of the children studied, 23 had elevated blood lead levels and 17 did not.

Khanna found that boys with elevated blood lead levels tested poorly on executive function, including memory and attention, while the effects of lead on girls were much less pronounced. Additionally, the study indicated that elevated blood lead levels had a more significant negative impact on [executive function](#) than reading readiness.

Unlike previous research, Khanna's study is the first to indicate that very [young children](#) already suffer the negative consequences of lead exposure and that the cognitive consequences of lead exposure are more severe for boys than girls.

More information: The January/February 2015 issue of the *Journal of Environmental Health* is available online:
www.neha.org/pdf/JEH/JEH1-2.15_TOC.pdf

Provided by Creighton University

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