

Adolescents with weak working memory and progressive drug use at risk for later addictions

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Drug use in adolescence is often linked to later substance-abuse problems, but a new study suggests that a key risk factor is a combination of weak working memory and difficulties with impulse control.

These risk factors predispose to progressive [drug](#) use in younger years and subsequent dependence, report researchers at three institutions in a paper placed online Feb. 16 by the journal *Addiction*. The study focused on alcohol, marijuana and tobacco use, the most commonly used drugs by adolescents.

For [young people](#) with difficulties in [impulse control](#), intervention programs that focus on simply stopping early drug use don't go far enough, said lead author Atika Khurana, assistant professor in the Department of Counseling Psychology and Human Services at the University of Oregon.

"We found that there is some effect that was carried through the early progression in drug use. It is a risk factor," said Khurana, who also is a research scientist in the UO's Prevention Science Institute. "But we also found that the underlying weakness in working memory and impulse control continues to pose a risk for later substance use disorders."

Working memory refers to the ability to concentrate on a task without being easily distracted. Youth with weak working memory tend to have problems controlling their impulses and thus appear to be at greater risk of continuing drug use.

The findings emerged from a final assessment of 387 young people, ages 18-20, who were recruited as 10- to 12-year-olds in 2004 for a long-term study by the Annenberg Public Policy Center of the University of Pennsylvania in collaboration with the

Children's Hospital of Philadelphia.

In a paper published in 2015 in the journal *Development and Psychopathology*, Khurana's team documented how adolescents with stronger working memory were better equipped to escape progression into heavy use following initial experimentation.

"Unanswered in our earlier work was whether it was specific forms of early use that predict later substance abuse," said Khurana, who was a postdoctoral fellow at the Annenberg Public Policy Center when the long-term study began. "People really hadn't focused on the heterogeneity of drug-use patterns. Some youth can start early and experiment but not progress while others experiment and progress into heavier drug use."

Analyzing multiple waves of data from early to late adolescence, the researchers found that experimenting with drugs at an early age wasn't a key factor in predicting later substance use disorders. It was the progression in drug use along with weakness in working memory and impulse control difficulties that predicted substance use disorders at later ages.

The researchers also reported that underlying weaknesses in working memory and impulse control continue to pose a risk for later substance use disorders, apart from early drug use progression.

"Substance use disorders are a major public health concern in this country," Khurana said. "The onset of substance use happens during adolescence. There is a lot of research that links early onset of use to later [substance use disorders](#). Our study advances the field by showing that just addressing early use is not going to solve the problem."

"Drug prevention strategy in the schools typically focuses on middle school when early drug use tends to take place and assumes that any drug use at all is a problem," said co-author Dan Romer, research director of the Annenberg Public Policy Center. "This study suggests that prevention needs to be more nuanced. The risk depends on whether drug use is likely to progress."

Interventions that strengthen [working memory](#) and cognitive processing related to inhibiting impulsive responses need to be developed to help adolescents better navigate drug-related temptations, Khurana said.

More information: Atika Khurana et al, Working Memory Ability and Early Drug Use Progression as Predictors of Adolescent Substance Use Disorders, *Addiction* (2017). [DOI: 10.1111/add.13792](https://doi.org/10.1111/add.13792)

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