Interaction Between Polygenic Risk for Cannabis Use and Environmental Exposures In The Detroit Neighborhood Health Study

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Due to the underrepresentation of African-Americans (AAs) In gene identification studies, the genetic architecture of cannabis use in AAs has been relatively understudied (exceptions include Gelernter et al., 2014, Sherva et al, 2016, Agrawal et al., 2017); thus, despite a rich epidemiologic literature on social determinants of cannabis involvement, few studies have examined gene–environment interactions on cannabis use outcomes in AAs. Using data from AA participants (n=1547) in the Detroit Neighborhood Health Study, a sample of majority AA Detroit residents, we constructed a polygenic risk score (PRS), by combining top (*p*-value $<5\times10^{-5}$) genetic variants from a genome wide association study of cannabis use conducted within an AA sample from the Grady Trauma Project (unpublished). After testing for an association between the PRS and cannabis use frequency, we examined interactions with three environmental contexts that may moderate this genetic association: exposure to traumatic events, neighborhood social cohesion, and neighborhood physical disorder. Results of moderation analyses indicated that the association between the PRS and cannabis use was greater among individuals who had experienced a higher number of traumatic events ($p<0.01$). The association between the PRS and cannabis use was slightly diminished among individuals who lived in neighborhoods characterized by greater social cohesion ($p<0.1$), and no effect was observed for neighborhood physical disorder. Findings from this study highlight the potency of risk conferred by traumatic events and implicate neighborhood cohesion as a potentially modifiable protective factor against cannabis use among AAs living in Detroit.