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The heritability of alcohol use disorder (AUD) ranges between 40 to 60%, as demonstrated by twin studies. Environmental factors are hence of importance for the developmental trajectory of the disorder. Gene-by-environment interactions indeed influence neuroplasticity and determine the individual’s susceptibility or resilience to AUD. Lately, a role of Vesicular Glutamate Transporter 2 (VGLUT2)-mediated neurotransmission has been indicated in studies of addiction- and alcohol-related phenotypes. We previously demonstrated an association between the single nucleotide polymorphism (SNP) rs2290045 in the VGLUT2 gene and alcohol dependence as well as showed an interaction effect between voluntary ethanol drinking and early life stress on Vglut2 expression in the ventral tegmental area of outbred rats. In the present study, using a population-based, cross-sectional and retrospective design, we aimed to investigate the association between two candidate VGLUT2 SNPs, rs1900586 and rs2290045, and aversive as well as supportive environmental factors on alcohol misuse in young adults. A total of 2,500 (52.6% females) individuals (mean age: 22.15 years) were included in the study. Aversive life events (i.e., physical violence, verbal aggression, witnessing violence) and parent-child relationship (i.e., early: until 18 years of age; lifetime: until present) were self-reported. Alcohol misuse was assessed using the AUD Identification Test (AUDIT). Preliminary results showed no main genotype effects on drinking profile. Multivariable analyses revealed that SNP rs1900586 interacted with exposure to verbal aggression and early parent-child relationship in respect to AUDIT scores. Male carriers of the major (T) allele reported higher AUDIT scores when exposed to verbal aggression and poor early parent-child relationship than the C carriers exposed to the same environment, while the opposite pattern was noted in the presence of supportive parent-child relationship. In individuals with symptoms of dependence or harmful alcohol use, SNP rs1900586 interacted with exposure to physical violence and parent-child relationship (early and lifetime) in both sexes. The same interaction effect was detected for SNP rs2290045 in females. These preliminary findings provide the first evidence that VGLUT2 genotype moderates the environmental