



# Utrecht University

## **Examining the Impact of Negative Life Events on Alcohol and Cannabis Use Among Adolescents: the Mediating Role of Self-efficacy**

Master thesis

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Disclaimer: This thesis has been written as a study assignment under the supervision of a Utrecht University Teacher. Ethical permission has been granted for this thesis project by the ethics board of the Faculty of Social and Behavioral Sciences, Utrecht University and two university teachers have assessed the thesis. However, the thesis has not undergone a thorough peer-review process so conclusions and findings should be read as such.

# **EXAMINING THE IMPACT OF NEGATIVE LIFE EVENTS ON ALCOHOL AND CANNABIS USE AMONG ADOLESCENTS: THE MEDIATING ROLE OF SELF-EFFICACY**

## **Abstract**

This quantitative study investigates the effect of negative life events (NLEs) on alcohol and cannabis use among Dutch adolescents aged 14-18, with self-efficacy as a possible mediating variable. Utilizing data (N=1317) from the Tracking Adolescents' Individual Lives Survey (TRAILS), a population-based prospective cohort study focusing on Dutch adolescents, this research aims to provide insights into the longitudinal relationship between NLEs and substance use behaviors. Two separate mediation analyses, both with self-efficacy as a mediator, were conducted: one with alcohol use as the outcome variable and another with cannabis use as the outcome variable. The findings revealed no significant link between NLEs and alcohol use, while a positive relationship was observed between NLEs and cannabis use. Furthermore, a notable but small effect on self-efficacy was observed as the impact of NLEs increased. However, self-efficacy did not mediate the relationship between NLEs and substance use. More research is needed to understand how to help young people who have experienced NLEs avoid using cannabis or other substances to cope. Additionally, raising awareness of the negative effects of cannabis and providing alternative coping strategies can promote greater well-being among adolescents.

*Keywords:* adolescents, negative life events, self-efficacy, alcohol use, cannabis use, TRAILS.

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## **EXAMINING THE IMPACT OF NEGATIVE LIFE EVENTS ON ALCOHOL AND CANNABIS USE AMONG ADOLESCENTS: THE MEDIATING ROLE OF SELF-EFFICACY**

Although adolescent substance use has decreased over the past decade, by the time adolescents graduate from high school, 48% will have used alcohol, 17% tried cigarettes, and 10% used cannabis (Boer et al., 2022). Adolescence is a critical period for vulnerability to addictions involving substances like alcohol and cannabis (Crews et al., 2007). Early use of these substances can impact neurological development, social adjustment, and increase the risk of later substance use disorders (Sussman, Skara & Ames, 2008). This article focuses on alcohol and cannabis due to their high prevalence and health risks. Alcohol use is linked to coronary and liver diseases, risky sexual behavior, crime, suicide, and traffic accidents (Shield, Parry, & Rehm, 2014). Cannabis use can cause short-term cognitive impairments, memory loss (Chan et al., 2021), and difficulties with attention and concentration (Levine et al., 2017). Furthermore, adolescent cannabis consumption is associated with an increased risk of developing depression and suicidal behavior later in life, even in the absence of a premorbid condition (Gobi et al., 2019).

A critical intersection between these substance use behaviors and transitions to adulthood is the impact of childhood stressors (Rogers et al., 2021). More than 50% of Dutch people experience at least one traumatic event in their youth, which confirms that life events and difficulties are more common in adolescents' everyday experiences (Bussemakers, Kraaykamp & Tolsma, 2019). These life events include, for example, parental divorce, child abuse, and domestic violence (Vink et al., 2019). Previous research shows that negative life events (NLEs) and psychological distress relate to substance use (Basedow et al., 2020; Carliner et al., 2016; Hagborg, Thorvaldsson & Fahlke, 2020; Nordfjærn, Hole & Rundmo, 2010). Adverse experiences in early life can potentially modify both the brain's structures and the physiological processes associated with mood and behavior (Teicher, & Samson, 2016). Additionally, coping mechanisms, such as substance use, are linked to deficiencies in cognitive and emotional processing (Gilbert, 2009).

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A factor that could play a role in the effect between NLEs and the use of alcohol and cannabis is self-efficacy. Self-efficacy refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (Bandura, 1977). Individuals with high self-efficacy perceive more control over their lives, employ healthier coping mechanisms, exhibit greater resilience, and are less vulnerable to the negative impact of adversity (Cassidy, 2015). Consequently, they are less likely to turn to substances as a means of coping (Kadden & Litt, 2011). Self-efficacy may serve as a possible mediator here because adolescents who experienced NLEs tend to have lower levels of self-efficacy (Saigh et al., 1995), whereas low levels of self-efficacy are related to higher levels of substance use (Fathiandastgerd et al., 2016). This can prove to be the working mechanism between NLEs and substance use (Fathiandastgerdi et al., 2016).

The current study investigates the relationship between NLEs among Dutch adolescents aged 12-18 and their use of alcohol and cannabis, assessing whether self-efficacy acts as a mediating factor. It aims to understand how self-efficacy can help individuals deal with tough situations and possibly avoid using these substances. It has practical significance, suggesting that interventions targeting the enhancement of adolescents' coping abilities may be effective in preventing or mitigating substance use. Furthermore, as Fathiandastgerdi et al. (2016) emphasize the need for longitudinal research on this topic, this study addresses a research gap by employing a longitudinal design in investigating the relationship between NLEs, and alcohol and cannabis use among adolescents.

This research holds societal importance. If NLEs and self-efficacy relate to levels of alcohol- and cannabis use, it could be possible to reduce substance consumption by influencing cognitive, emotional, and behavioral reactions to significant life stress and by reducing contemporarily psychosocial distress (Nordfjærn, Hole & Rundmo, 2010). Overall,

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the research aims to provide practical insights for promoting the well-being of Dutch adolescents and addressing alcohol and cannabis use concerns within the context of their experiences. By conducting this research among young people, a healthier generation can be fostered in the future.

This longitudinal research contributes to the literature about reducing substance use as it can create a clearer view of the causes and stimulators of alcohol- and cannabis use among Dutch adolescents with NLEs. It aims to answer the following research question: *To what extent is the relationship between negative life events (NLEs) experienced by Dutch adolescents aged 14-18 and their use of alcohol and cannabis mediated by self-efficacy?*

## **Alcohol- and cannabis use**

This study will investigate the relationship between NLEs and two substances: alcohol and cannabis. According to Boer et al. (2022), nearly a quarter of Dutch students aged 12 to 16 have consumed alcohol in the past four weeks, and one in five students have engaged in binge drinking during the past month. Binge drinking involves consuming a large quantity of alcohol in a short period, leading to rapid intoxication. Typically, binge drinking for men involves consuming five or more drinks in about two hours, while for women, it involves four or more drinks within the same timeframe (Mitchell & McCambridge, 2023). Notably, Boer et al. (2022) found no significant differences in the prevalence of alcohol use and binge drinking between boys and girls.

Coping motives, defined as using alcohol to alleviate negative emotions, are indirectly associated with alcohol use through the experience of drinking-related problems (Bresin & Mekawi, 2021). This includes situations where individuals consume alcohol to cope with stress or to temporarily escape from worries and negative feelings. These findings underscore the complex interplay between coping mechanisms, negative life events, and substance use behaviors, highlighting the need for further investigation in this area. Cannabis is by far the

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most popular illegal stimulant among young people in the Netherlands (Rombouts et al., 2020). In the past month, almost 6 percent of 12 to 16-year-old secondary school students say they have used cannabis (Boer et al., 2022). In the Netherlands, cannabis policy allows for regulated sale and possession of small quantities for personal use in licensed coffee shops. This decriminalization approach aims to minimize legal consequences for users while maintaining public order (Knottnerus, 2023). However, concerns remain about its impact on youth, including potential health risks. Just as with alcohol use, coping with NLEs is also mentioned as an important motive for cannabis use (Fox et al., 2011).

### **Negative life events**

The concept of NLEs among youth encompasses a spectrum of challenging experiences ranging from typical life transitions to distressing circumstances. These events can vary in intensity, from everyday stressors to more severe situations that may lead to heightened emotional distress and potential long-term consequences such as posttraumatic stress disorder (PTSD), anxiety disorders, or depression (Spinoven et al., 2010). It is crucial to distinguish between traumatic experiences and NLEs: traumatic events typically involve extreme stress or harm and often necessitate specialized interventions due to their profound and enduring impact on mental health.

NLEs, while not always traumatic, can still significantly impact mental well-being (Meiser-Stedman et al., 2012). For instance, experiences like parental divorce or witnessing domestic violence between parents are examples of NLEs that may indirectly affect children. These events create an environment of tension and stress within the family, which can disrupt a child's development of effective coping strategies and ability to manage stressful situations effectively (Shields-Zeeman, Van Bon-Martens, & Smit, 2021). Unlike direct trauma such as child abuse, where harm is inflicted directly on the child, the harm from NLEs often arises from the adverse effects of the stressful environment.

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Understanding these distinctions helps to highlight the varied pathways through which NLEs can influence youth development and mental health outcomes. It underscores the importance of recognizing both traumatic and non-traumatic adverse experiences in assessing their impact and designing appropriate interventions to support youth facing such challenges. Research shows that NLEs and psychological distress relate to substance use (Basedow et al., 2020; Carliner et al., 2016; Hagborg, Thorvaldsson & Fahlke, 2020; Nordfjærn, Hole & Rundmo, 2010). Previous studies demonstrate the link between NLEs and alcohol use among adolescents (Cheney et al., 2018; Lee & Chen 2017). Family-related life events seem to play the largest role in this context (Türkmen et al., 2024). For example, greater alcohol involvement and more problematic drinking patterns were observed among adolescents from families characterized by parental conflict (Bray et al., 2022) and separation (Hoffmann, 2022). Moreover, NLEs were also associated with the development of using cannabis (Fox et al., 2011; Hyman & Sinha, 2009; Zhao et al., 2023). In addition, the study of Van Der Pol et al. (2013) shows that the risk of cannabis dependence increased with 43% with every additional NLE. Thus, NLEs are an established risk factor for both alcohol and cannabis use.

Using substances to heal from NLEs is in line with the self-medication theory. The self-medication theory posits that individuals use substances to relieve emotional pain, trauma, anxiety, depression, or other psychological symptoms (Khantzian, 1997; Reed et al., 2007). According to this theory, individuals may experience distressing psychological symptoms resulting from NLEs such as trauma, loss, or stress. These symptoms can include anxiety, depression, PTSD, or other forms of emotional pain. Recognizing drug use as a coping mechanism for trauma-related distress aligns with the stress response system theory from a more biological perspective (Burchfield, 1979). This theory suggests that trauma can disrupt the body's ability to manage stress effectively. This disruption often stems from



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alterations in neurobiological pathways, particularly the hypothalamic-pituitary-adrenal (HPA) axis, which regulates the release of stress hormones like cortisol (Dedovic et al., 2009). Individuals who have experienced NLEs may develop a heightened sensitivity to stressors due to these neurobiological changes (Daughters et al., 2009). As a result, they may be more inclined to seek relief from stress through drug use. The difference between these two theories lies in the underlying mechanisms. The stress response system theory emphasizes neurobiological dysregulation resulting from NLEs, while the self-medication theory focuses on the psychological symptoms of NLEs driving substance use.

### **Self-efficacy as a potential mediator**

Self-efficacy is defined as an individual's belief in their capability to control specific activities, psychological and social functioning, or navigate challenging situations. It has garnered substantial attention in the psychological literature (Bandura, 1977; Sklar, Annis & Turner, 1997). In the context of Bandura's Social Cognitive Theory (2001), which posits that individuals' behaviors are shaped by interactions between personal factors, environmental influences, and behavioral outcomes, self-efficacy plays a pivotal role. Self-efficacy refers to one's belief in their ability to achieve specific goals or perform behaviors that influence their life. This belief is largely influenced by personal mastery experiences, where successful outcomes enhance self-efficacy. Research consistently shows that adolescents with low self-efficacy are more likely to resort to substance use as a coping mechanism (Burlison & Kaminer, 2005; Fathiandastgerd et al., 2016; Smorti, 2014). Therefore, Bandura's theory highlights the importance of fostering positive personal experiences to strengthen self-efficacy and reduce the likelihood of substance use among youth facing NLEs.

Additionally, various studies have consistently found that adolescents dealing with NLEs tend to have notably lower levels of self-efficacy (Chung et al., 2021; Saigh et al., 1995;

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Sartor, 2016). Notably, the direction of correlations in these studies suggests that increased exposure to NLEs leads to a decline in self-efficacy. In the context of the self-medication theory, self-efficacy serves as a crucial mediator between NLEs and substance use. High self-efficacy diminishes the perceived need for substance use as a coping mechanism by promoting adaptive coping strategies, resilience against emotional distress, and goal-directed behavior (Mosteo et al., 2016). According to this theory, individuals with strong self-efficacy are less likely to turn to substances, relying instead on effective coping mechanisms to navigate life challenges.

Furthermore, it is noteworthy that experiencing fewer NLEs may foster a higher likelihood of success and positive outcomes across various endeavors. Successes and positive experiences, in turn, reinforce an individual's belief in their capability to handle challenges, contributing to an increased sense of self-efficacy (Zulkosky, 2009). This resilience, emerging from a history of successfully overcoming obstacles, can function as a protective factor, mitigating the impact of stressors on substance use behaviors (Fathiandastgerdi et al., 2016). The confidence individuals derive from their proven ability to overcome challenges may act as a deterrent, steering them away from engaging in risky behaviors such as substance use.

Based on these theories and the existing literature, seven hypotheses are formulated (see Figure 1 for a model).

H1: NLEs are positively associated with alcohol use.

H2: NLEs are negatively associated with self-efficacy.

H3: Self-efficacy is negatively associated with alcohol use.

H4: Self-efficacy mediates the relationship between NLEs and alcohol use.

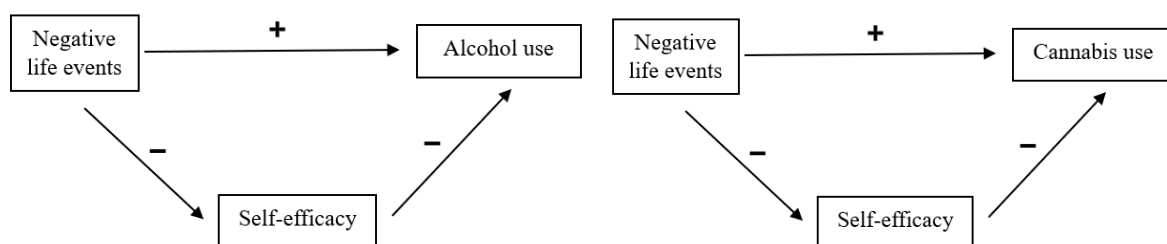
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H5: NLEs are positively associated with cannabis use.

H6: Self-efficacy is negatively associated with cannabis use.

H7: Self-efficacy mediates the relationship between NLEs and cannabis use.

**Figure 1:** Two models of the relationship between NLEs and alcohol/cannabis use with self-efficacy as a mediator.



## Methods

### Design and Participants

This quantitative, longitudinal uses data from the Tracking Adolescents' Individual Lives Survey (TRAILS), a population-based prospective cohort study focusing on Dutch adolescents. Participants in the cohort were born between 1989 and 1991 and predominantly originate from the northern region of the Netherlands, specifically the province of Groningen. At the start of TRAILS in 2000, participants were initially aged 10–12 years, with a mean age of 11.1 years. TRAILS conducts assessments at regular intervals, typically every two to three years (Oldehinkel et al., 2015). The present study uses data from waves 3 (2005 to 2007) and 4 (2008 to 2010), with a sample size of 2229 adolescents. Of these, 374 participants had not completed both scales and were not included in the analyses. Furthermore, there were 538 participants who did not complete either of the two scales or the question about alcohol or cannabis use. These participants could not be included. Only

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participants who completed the questionnaire in both waves and answered the questions about alcohol and cannabis use were included in the analysis. A total of 1317 participants remained who could be included in the analyses. Of these, 56% are female and 44% are male. At wave 3, the participants were between 14 and 18 years old, with a mean age of 15.7 years old.

### **Procedure and Ethics**

TRAILS investigates the development of mental and physical health from preadolescence into adulthood (de Winter et al., 2005; Huisman et al., 2008). It is characterized by its multidisciplinary approach with a wide range of data on social, psychological, and biological factors. This data is collected from various sources, including adolescents themselves, parents, teachers, classmates, and siblings, through methods such as questionnaires, interviews, tests, and physical measurements.

The sampling process involved two stages. First, five municipalities in the North of the Netherlands, covering both urban and rural areas, provided information from community registers on all residents born between October 1, 1989, and September 30, 1991. This included their name, date of birth, gender, and address. Next, primary schools, including those for special education, were contacted with details about TRAILS' goals, design, and procedures. Participation from schools was necessary for eligible children and their parents to be included. Out of 135 identified primary schools, 13 declined to participate, resulting in the exclusion of 338 children. Secondly, parents/guardians received information brochures outlining the study's goals, selection process, confidentiality measures, and the assessments involved.

After intensive recruitment efforts (including telephone calls, reminder letters, and home visits), a total of 2230 children (76.0%) were included in the study at baseline (Huisman et al., 2008). The survey was approved by the national ethical committee 'Centrale Commissie Mensgebonden Onderzoek' (de Winter et al., 2005). Informed consent at each

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assessment wave was obtained from all participants and their parents/guardians after the nature of the study had been fully explained.

### **Measuring instruments**

#### ***Negative life events (T3)***

For NLEs, a scale score of how much effect these NLEs have on adolescents is used as the predicting variable. This is a scale of five items with statements such as "I am often sad because of NLEs" (see Appendix B). There were three response options: "yes", "no", and "maybe". None of these items needed to be reversed and the variable about NLEs was created by calculating the mean of these five items. It must be emphasized that this scale score does not say anything about the frequency of these NLEs, but about how much impact these NLEs have had on the participants. Eventually, the Cronbach's alpha for the questions about NLEs was 0.76.

#### ***Self-efficacy (T4)***

Self-efficacy at wave 4 was measured with the General Self-efficacy Scale which consisted of five items (see Appendix B). An example statement was: "I always manage to solve difficult problems if I put enough effort into it". The response categories ranged from 1 = "completely incorrect", to 4 = "completely right". None of these items needed to be reversed. The Cronbach's alpha for the questions about self-efficacy was 0.79. The variable about self-efficacy was created by calculating the mean of these five items.

#### ***Alcohol- and cannabis use (T4)***

Alcohol and cannabis use were measured by asking young people about the use of these two substances in the past four weeks. For alcohol, the question was "How often have you drunk alcoholic beverages in the past four weeks?". This meant the number of occasions, such as a party, going out, or an evening at home. There were 14 answer options from (0=never, [...], 13=more than 40 times). The same question was asked for cannabis use,

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namely: “How often have you used weed (marijuana) or hashish in the past four weeks?”.

Here were the same 14 answer options as for the question about alcohol consumption.

### **Data analysis**

All statistical analyses were performed using the open-source statistics program JASP (Version 0.18.3). Before analyzing the data, it was cleaned by identifying and addressing missing data and outliers. If data for one item in a scale was missing, it was replaced with an average value. The assumptions of normality of residuals, linearity, homoscedasticity, and a continuous dependent variable were met (see Appendix C). The highest measure of VIF was 1.030, so no multicollinearity was found. After checking for the assumptions, the descriptive statistics of NLEs, self-efficacy, and substance use were requested. Bivariate analysis explored correlations between NLEs, self-efficacy, and substance use variables, revealing initial associations and setting the stage for mediation analysis.

Two mediation analyses were conducted with the use of JASP where in the first analysis alcohol use was the outcome variable and in the second analysis cannabis use was the outcome variable. NLEs were specified as the independent variable and self-efficacy as the mediator.

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## Results

### Descriptive statistics

Table 1 shows the descriptive statistics of the sample of this study. Of the 1317 respondents, 56% were female and 44% were male. The age of the respondents varied from 14 to 18 years old ( $M=15.73$ ,  $SD=.72$ ). Furthermore, children's scores on NLEs varied from 0 to 2 ( $M=.53$ ,  $SD=.52$ ). Alcohol- ( $M=1.42$ ,  $SD=2.07$ ) and cannabis use ( $M=1.01$ ,  $SD=2.84$ ) scores were seen between 0 to 13. For children's self-efficacy, the responses were between a score of 1 and 4 ( $M=2.89$ ,  $SD=.55$ ).

**Table 1**

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*Descriptive statistics*

	<b>M</b>	<b>SD</b>	<b>Minimum</b>	<b>Maximum</b>
Age	15.73	0.72	14	18
NLEs	0.53	0.52	0	2
Self-efficacy	2.89	0.55	1	4
Alcohol use	1.42	2.07	0	13
Cannabis use	1.01	2.84	0	13

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*Note. NLEs = Negative life events*

### Correlation analysis

To test the mutual relationship and significance of the variables, a correlation analysis was carried out. Table 2 shows that NLEs correlate significantly, but weakly, with self-efficacy ( $r=-.172$ ,  $p<.001$ ). This correlation is negative and seems to indicate that the effect of NLEs leads to reduced self-efficacy. Furthermore, the impact of the NLEs also correlates positively with cannabis use ( $r=.064$ ,  $p=.020$ ). This indicates a weak correlation whereby a greater impact of the NLE leads to more use of cannabis. Alcohol and cannabis use also

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correlate significantly with each other ( $r=.242, p<.001$ ). This positive correlation indicates that young people who use one substance often use the other as well. There is no significant correlation between self-efficacy and either substance. Additionally, the correlation matrix does not show a link between NLEs and alcohol use.

**Table 2**

*Correlation matrix*

<b>Variable</b>	<b>1.</b>	<b>2.</b>	<b>3.</b>	<b>4.</b>	<b>5.</b>	<b>6.</b>
1. NLEs	—					
2. Self-efficacy	-.17**	—				
3. Alcohol use	-.01	.05	—			
4. Cannabis use	.06*	.00	.24**	—		
5. Gender	-.31**	.12**	.14**	.12**	—	
6. Age	-.00	.01	.04	.04	.01	—

*Note.* \*\*Correlation is significant at  $p < 0.01$  (2-tailed).

*Note.* \* Correlation is significant at  $p < 0.05$  level (2-tailed).

### Mediation analysis with alcohol use as outcome variable

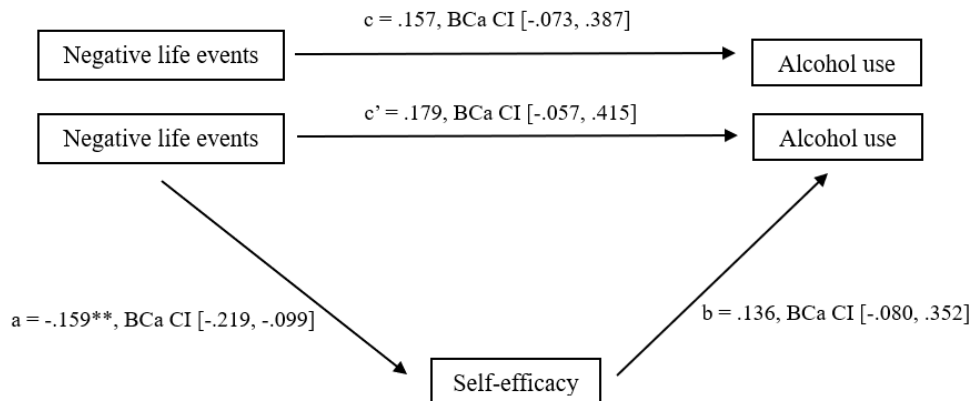
Figure 2 shows the mediation analysis with alcohol use as the outcome variable. This model controlled for age and gender. This model does not show a significant total effect (path c) between the impact of NLEs and alcohol use,  $b=.157$ , BCa CI  $[-.073, .387]$ . Furthermore, the effect between NLEs and alcohol use, controlled for self-efficacy (path c') also showed no significance,  $b=.179$ , BCa CI  $[-.057, .415]$ . Finally, the indirect effect (path a,b) was also not found in this model,  $b=-.022$ , BCa CI  $[-.057, .013]$ . This means that there is no mediation effect of self-efficacy in this model. However, a small significant relationship was found between NLEs and self-efficacy (path a),  $b=-.159$  BCa CI  $[-.219, -.099]$ . This effect had also been demonstrated previously in the correlation analysis. In this model, 3.5% of the variance is explained by self-efficacy as a mediator.



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**Figure 2**

*Mediation model of the effect of NLEs on alcohol use with self-efficacy as a mediator*



*Note.* **\*\***significant at  $p < 0.01$  (2-tailed).

*Note.* \* Correlation is significant at  $p < 0.05$  level (2-tailed).

*Note.* This model is controlled for gender and age.

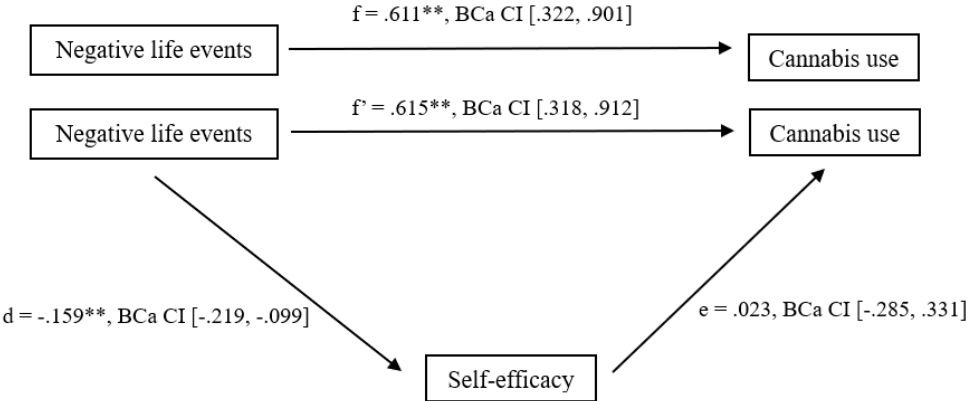
### Mediation analysis with cannabis use as outcome variable

Figure 3 shows the mediation analysis with cannabis use as the outcome variable. This model is also controlled for age and gender. This model shows a significant total effect (path *f*) between the impact of NLEs and cannabis use,  $b = .611$  BCa CI [.322, .901]. This means that young people who suffer more from these NLEs show more use of cannabis. Also, there is a significant effect between NLEs and cannabis use, when controlled for self-efficacy (path *f'*),  $b = .615$ , BCa CI [.318, .912]. This model does not show a mediating effect (path *d, e*) of self-efficacy because the indirect effect is not significant,  $b = -.004$ , BCa CI [-.053, .046]. In this model, 9.3% of the variance is explained by self-efficacy as a mediator.

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**Figure 3**

*Mediation model of the effect of NLEs on cannabis use with self-efficacy as a mediator*



*Note. \*\*p < 0.01*

*Note. \* p < 0.05*

*Note. This model is controlled for gender and age.*

**Discussion**

This study attempted to uncover the underlying mechanisms involved in substance use among young people by testing the effect of NLEs on alcohol and cannabis use. In this context, self-efficacy was tested as a mediating factor. Furthermore, an attempt was made to direct the research in a longitudinal direction by measuring the independent and dependent variables at two different moments. NLEs were measured in 2006 and self-efficacy together with alcohol and cannabis use in 2009. In no case does this study show a mediating role of self-efficacy. However, a positive effect has been found between NLEs and cannabis use.

**NLEs and alcohol- and cannabis use**

H1 posed that NLEs are positively associated with alcohol use. However, the results of this study showed no effect between NLEs and alcohol use. Although earlier studies found positive associations between NLEs and alcohol use (Cheney et al., 2018; Lee & Chen 2017),

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this study was not able to these effects. Additionally, these results are also not in line with the self-medication theory which states that individuals use substances to relieve traumatic stress symptoms (Khantzian, 1997; Reed et al., 2007). This may be because the primary motivations for drinking among young people are social and enhancement motives—such as enjoying parties and getting drunk—rather than conformity or coping motives, which are more directly related to managing negative feelings or fitting in (Smit et al., 2022).

In line with H5, this study found that NLEs are positively associated with cannabis use. This is consistent with previous studies that have indicated the same link (Fox et al., 2011; Hyman & Sinha, 2009; Zhao et al., 2023). This finding does support the self-medication theory (Khantzian, 1997; Reed et al., 2007), which could suggest that young people use cannabis to cope with stressful experiences from the past. This is also in line with previous literature that states that young people may use cannabis as a coping mechanism for dealing with NLEs, as cannabis has the potential to suppress negative emotions (Fox et al., 2011). Based on these results, it seems to make a difference which type of substance young people use to deal with their NLEs. Although alcohol and cannabis are both tolerated in the Netherlands, there may be differences in the social motivations for using alcohol compared to cannabis. An important conclusion is that one drug is not the same as the other and that each drug must therefore be examined separately.

### **The mediating role of self-efficacy**

Unlike H4 and H7, which predicted a mediating role of self-efficacy in the relationship between NLEs and alcohol or cannabis use, no mediation effect was found in both models. This is also not in line with the study by Nordfjaern, Hole, & Rundmo (2010), which found a small mediation effect. Yet there are certainly similarities with this study. This study, like the current study, shows the negative relationship between NLEs and self-efficacy. This is in line with H2 and is also confirmed by other previous studies (Chung et al., 2021; Saigh et al.,

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1995; Sartor, 2016). However, the mediation effect of self-efficacy appears to stagnate in the relationship between self-efficacy and substance use. This research shows no link between self-efficacy and alcohol and cannabis use, which refuses H3 and H6 and is not in line with previous studies (Burlison & Kaminer, 2005; Fathiandastgerd et al., 2016; Smorti, 2014).

These findings are also not in line with the Social Cognitive Theory (Bandura, 2001). This theory states that self-efficacy can be used as a coping mechanism to avoid drug use. The current study disputes this and it could be that young people use other types of coping mechanisms to avoid using substances. Individuals might use alcohol or cannabis as a coping mechanism for stress, anxiety, or other emotional challenges. In such cases, the need for coping might override their self-efficacy beliefs. Thus, even individuals with high self-efficacy might turn to substance use as a means to manage their emotional states.

### **Strengths & limitations**

A significant strength of this study is the sample drawn from across the entire Netherlands, which includes schools from both rural and urban areas. This broad geographic coverage ensures a diverse and representative sample, enhancing the external validity of the findings. To add on, as Fathiandastgerdi et al. (2016) emphasized the need for longitudinal research on this topic, the longitudinal aspect was partially achieved, measuring the independent variable and mediator at the same time point, and the outcome variable at a later time point, allows for a more nuanced understanding of the temporal relationships between these factors. This design helps to infer causality better than cross-sectional studies.

A limitation of this study is that only one question has been used to measure alcohol or cannabis use. This study only assessed alcohol and cannabis use over the past four weeks, which may not fully capture the extent or patterns of use. Employing a scale score to measure problematic substance use would have provided a more detailed and accurate understanding of the participants' behaviors and the potential impact of NLEs and self-efficacy on these

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behaviors. The measurement of NLEs in this study appears broad and lacks specificity regarding the nature of these events. Participants self-reported these events without distinguishing between different types of NLEs. Recent research by Zhao et al. (2023) distinguishes between two types of NLEs: controlled and uncontrolled. Controlled NLEs are events where the individual, such as a young person, has some level of influence or control. In contrast, uncontrolled NLEs are events that occur without the individual having any influence or control over them. Zhao et al. (2023) found that controllable, but not uncontrollable, NLEs were associated with increased odds of alcohol and cannabis initiation. Unlike this study, the current study did not differentiate between these types of NLEs, potentially limiting the understanding of how different types of stressors may influence substance use initiation among young people.

Furthermore, a distinction can also be made between different types of NLEs based on the adolescent's environment in which they occur. These events can be categorized into financial, social, and family-related NLEs. Each category represents distinct challenges that may impact adolescents differently, influencing their development and well-being. An earlier study by Türkmen et al., (2024) shows that family-related NLEs show the highest effects. This distinction was not made in this study, so the results may be different.

### **Implications**

The differential impact of NLEs on cannabis versus alcohol use underscores the need for substance-specific research. This can lead to more specific prevention and intervention strategies that address the unique drivers of each type of substance use. This research only looked at alcohol and cannabis, but further research can also focus on different types of hard drugs such as ecstasy and cocaine. It can be valuable to find out what type of sedation young people are looking for after experiencing NLEs. Furthermore, this study did an attempt for longitudinal research, to better understand the long-term effects of NLEs and the role of self-

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efficacy, more longitudinal studies are necessary. Studies measuring cannabis use at a later time point may be interesting, as they allow examination of whether the effect of a negative event in childhood or adolescence has a long-lasting impact on cannabis consumption later in life.

With cannabis use, the association with NLEs was present. In the treatment of youth experiencing problems with cannabis use, it can be beneficial to address any underlying mental health issues stemming from prior NLEs. Qualitative research can possibly strengthen these findings by providing an in-depth understanding of individuals' experiences, perceptions, and emotions related to negative life events and their impact on cannabis use. It also helps uncover contextual factors and complex dynamics that influence the relationship between negative life events and substance use behaviors. Furthermore, by helping these young individuals cope with these NLEs, their cannabis use may also decrease or cease. Furthermore, possible interventions should address these findings by providing accessible mental health support, enabling young individuals to effectively cope with their past instead of resorting to cannabis use. It is crucial to educate young people that cannabis use does not resolve underlying issues, as many young people mistakenly believe it is an effective coping mechanism for dealing with NLEs (al'Absi & Allen, 2021).

However, self-efficacy does not appear to be one of these coping strategies which suggests that other factors may be influencing this relationship. Furthermore, future research needs to examine when and for which adolescents NLEs negatively impact their substance use. By identifying protective and risk factors associated with substance use, interventions can be designed more effectively. Targeting interventions toward adolescents who are most vulnerable to the negative effects of NLEs will be particularly beneficial in mitigating substance use risks.

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Lastly, given the (small) effect of NLEs on self-efficacy, future studies could investigate how different types of interventions, including cognitive-behavioral therapy and peer mentoring (Miller, 2020), specifically enhance self-efficacy and whether these changes subsequently impact substance use behaviors. These practical implications can focus on improving self-efficacy to help adolescents cope with NLEs and possibly prevent other adverse outcomes.

In conclusion, this study investigated the relationship between NLEs and substance use among adolescents and the mediating role of self-efficacy. No significant link was found between NLEs and alcohol use. However, a positive relationship was observed between NLEs and cannabis use. Additionally, there was a noted decrease in self-efficacy as the impact of NLEs increased. Despite this, self-efficacy did not mediate the relationship between NLEs and substance use. More research is needed into how young people who have experienced NLEs do not use cannabis, or other substances, to cope. By raising awareness among these youngsters about the enduring negative effects of cannabis and equipping them with effective alternative coping strategies, greater well-being can be promoted among youth.

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## Appendix A

### Reflection on Interdisciplinarity

This study investigated the impact of negative life events (NLEs) on alcohol and cannabis use among adolescents, with a specific focus on examining the mediating role of self-efficacy. To formulate its hypotheses and theoretical framework, the research integrates several theories, including the self-medication theory, the stress response system theory, and the social cognitive theory of Bandura (2001). By using these different theories in the design of this research, the researcher has made an attempt not only to explain the connections based on knowledge from her own field but also to incorporate other disciplines here. By adding insights from psychology, sociology, and public health, the study demonstrates an interdisciplinary approach.

The self-medication theory, which suggests that individuals use substances to cope with stress and negative emotions, provides a psychological perspective on the relationship between NLEs and substance use. The stress response system theory, which explores the physiological and psychological effects of stress, adds a biological dimension to the research. The social cognitive theory, emphasizing the role of observational learning, self-efficacy, and social influences on behavior, integrates social and psychological aspects into the study.

Research into problems such as substance use among young people can hardly be tackled other than in an interdisciplinary manner. The feeling of self-efficacy is psychologically based, but if this feeling of self-efficacy depends on the impact of NLEs, social factors play a role. It may also be biologically determined whether NLEs can have a major impact on an adolescent. Someone may also be biologically more likely to reach for substances such as weed more quickly.

Researching all disciplines and therefore including many factors in the research often becomes complicated and time-consuming. This research has by no means examined all factors that could influence substance use among young people. What makes it interdisciplinary is that the findings are always viewed and explained from multiple points of view. It is important in interdisciplinary research that the different disciplines are always taken into account when implementing policy, so that efficient and effective policy can ultimately be formed.

While the current study's interdisciplinary approach enriches its theoretical foundation, its practical implications underscore the importance of interdisciplinary collaboration. For instance, the findings that NLEs are linked to increased cannabis use and decreased self-efficacy among adolescents can inform policies that address multiple facets of adolescent well-being. By integrating psychological support, social interventions, and public health strategies, policymakers can develop more comprehensive and effective interventions. This approach ensures that interventions not only address the symptoms of substance use but also tackle the underlying causes, promoting overall adolescent well-being. But also, the use of multiple scientific research methods in investigating the problem can significantly enhance the depth of understanding of the research problem. For example, adding qualitative



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interviews to the research can elucidate the underlying motivations and contextual factors influencing substance use behaviors. Experimental designs, on the other hand, can help establish causal relationships between variables.

In conclusion, while this study demonstrates interdisciplinary elements by integrating theories from psychology, biology, and sociology, it may not be fully interdisciplinary if it lacks deep integration of these perspectives and collaborative efforts across disciplines. Nonetheless, the study's interdisciplinary approach enriches its theoretical foundation and underscores the importance of interdisciplinary collaboration in addressing complex social issues like adolescent substance use. By combining insights from various disciplines, researchers and policymakers can develop more effective strategies to improve the well-being of adolescents facing NLEs.

In conclusion, the interdisciplinary nature of this research is evident in its integration of theories from psychology, sociology, and public health to explore the impact of NLEs on adolescent substance use, with a specific focus on the mediating role of self-efficacy. While the study may not encompass all factors influencing substance use among young people, its interdisciplinary approach allows for a nuanced understanding of the complex interplay between individual, social, and biological factors. Moving forward, the practical implications of this research highlight the importance of interdisciplinary collaboration in developing comprehensive policies and interventions aimed at promoting adolescent well-being. By considering insights from various disciplines, policymakers can formulate more effective strategies that address both the symptoms and underlying causes of substance use, ultimately contributing to the holistic improvement of adolescent health outcomes.

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## Appendix B

### Used Scales

#### Effects of Negative life-events Scale (5 items, $\alpha = 0.76$ )

Vraag	Waarden	Codering
Denk je dat je <b>minder gezond</b> bent geworden door de nare dingen die je hebt meegemaakt?	Nee Misschien Ja	0 1 2
Denk je dat je <b>vaker boos</b> bent door de nare dingen die je hebt meegemaakt?	Idem	Idem
Denk je dat je <b>vaker te druk</b> bent door de nare dingen die je hebt meegemaakt?	Idem	Idem
Denk je dat je <b>vaker bang</b> bent door de nare dingen die je hebt meegemaakt?	Idem	Idem
Denk je dat je <b>vaker verdrietig</b> bent door de nare dingen die je hebt meegemaakt?	Idem	Idem

#### General Self-efficacy Scale (5 items, $\alpha = 0.80$ )

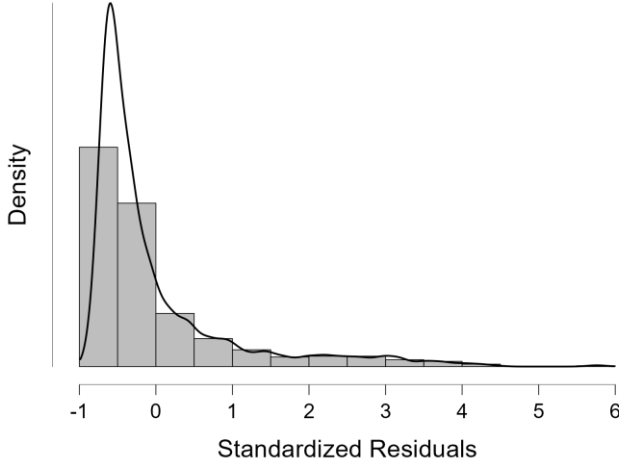
Vraag	Waarden	Codering
Het lukt me altijd moeilijke problemen op te lossen, als ik er genoeg moeite voor doe	Volledig onjuist Nauwelijks juist Enigszins juist Volledig juist	1 2 3 4
Als iemand mij tegenwerkt, vind ik toch manieren om te krijgen wat ik wil	Idem	Idem
Ik vertrouw erop dat ik onverwachte gebeurtenissen doeltreffend aanpak	Idem	Idem
Ik blijf kalm als ik voor moeilijkheden kom te staan omdat ik vertrouw op mijn vermogen om problemen op te lossen	Idem	Idem
Als ik in een benarde situatie zit, weet ik meestal wat ik moet doen	Idem	Idem

**EXAMINING THE IMPACT OF NEGATIVE LIFE EVENTS ON ALCOHOL AND CANNABIS USE AMONG ADOLESCENTS: THE MEDIATING ROLE OF SELF-EFFICACY**

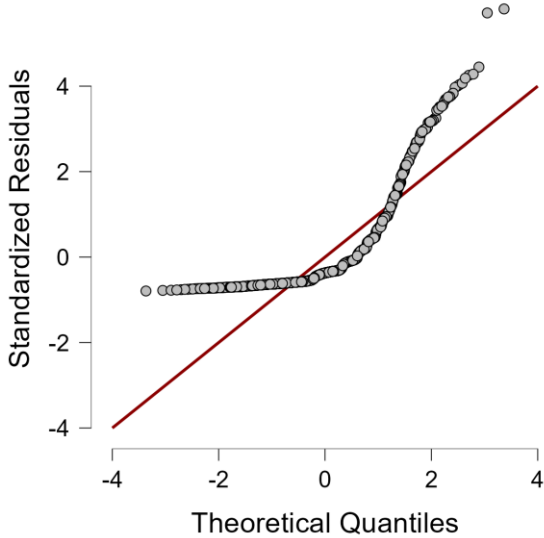
**Appendix C**

Assumptions

**Standardized Residuals Histogram**

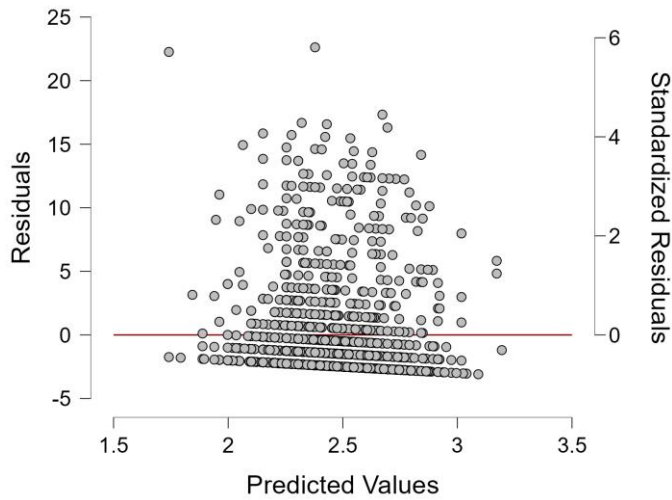


**Q-Q Plot Standardized Residuals**



# EXAMINING THE IMPACT OF NEGATIVE LIFE EVENTS ON ALCOHOL AND CANNABIS USE AMONG ADOLESCENTS: THE MEDIATING ROLE OF SELF-EFFICACY

## Residuals vs. Predicted



## Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p	Collinearity Statistics	
							Tolerance	VIF
H <sub>0</sub>	(Intercept)	2.425	0.108		22.557	< .001		
H <sub>1</sub>	(Intercept)	1.485	0.612		2.425	0.015		
	NLE_effects	0.367	0.210	0.049	1.747	0.081	0.970	1.030
	General_SE	0.257	0.197	0.036	1.301	0.194	0.970	1.030

## Casewise Diagnostics

Case Number	Std. Residual	SU_sum	Predicted Value	Residual	Cook's Distance
668	5.743	24.000	1.741	22.259	0.132

Note. Highest Cook's Distance was .132