



HAL
open science

Indirect effect of childhood maltreatment through insecure attachment on Food and Alcohol Disturbance in university students

Ludivine Ritz, Nicolas Mauny, Charlotte Montcharmont, Ninon Dessommes,
Denis Jacquet, Maud Lemerancier-Dugarin

► To cite this version:

Ludivine Ritz, Nicolas Mauny, Charlotte Montcharmont, Ninon Dessommes, Denis Jacquet, et al.. Indirect effect of childhood maltreatment through insecure attachment on Food and Alcohol Disturbance in university students. 2024. hal-04644568

HAL Id: hal-04644568

<https://hal.science/hal-04644568v1>

Preprint submitted on 15 Jul 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

**Indirect effect of childhood maltreatment through insecure attachment on Food
and Alcohol Disturbance in university students**

Ludivine RITZ¹; Nicolas MAUNY²; Charlotte MONTCHARMONT¹; Ninon
DESSOMMES¹; Denis JACQUET^{1*}; Maud LEMERCIER DUGARIN^{1*}

¹ Université de Caen Normandie, LPCN UR 7452, F-14000 Caen, France

² Université de Franche-Comté, Laboratoire de Psychologie UR3188, F-90000 Belfort, France

* equally contributed to this work

Corresponding author: Ludivine Ritz, UFR de Psychologie, Bâtiment L, Esplanade de la Paix,
14032 Caen Cedex 5 ; ludivine.ritz@unicaen.fr

ORCID number: 0000-0003-0320-8328

Number of words in abstract: 247

Number of figures: 1

Number of tables: 1

Abstract

Background: Food and Alcohol Disturbance (FAD) is characterized by disordered eating behaviors in combination with problematic alcohol use. A history of childhood maltreatment and insecure attachment are commonly observed in students with either alcohol use or eating disorders. However, the potential relationship between childhood maltreatment and insecure attachment on FAD behaviors has never been investigated.

Objective: This study examined the effects of insecure attachment and childhood maltreatment on FAD behaviors in students. It tested a model in which insecure attachment mediates the relationship between childhood maltreatment and FAD behaviors.

Participants and Setting: University students (N=401) were included in the present study and completed questionnaires about FAD, history of childhood maltreatment, and adult attachment.

Methods: Structural equation modeling was used to test the mediated effect of childhood maltreatment through attachment on FAD behaviors in students.

Results: Insecure attachment and childhood maltreatment were related; however, only insecure attachment had a direct effect on FAD behaviors. A history of childhood maltreatment was indirectly related to FAD, mediated by insecure attachment.

Conclusions: Attachment insecurity, particularly preoccupied and fearful patterns, had a direct effect on FAD behaviors in university students and mediated the relationships between childhood maltreatment and FAD. These findings may explain how early experiences of child maltreatment (especially sexual, physical, and emotional abuse) may impact attachment style, and later, in adulthood, on FAD behaviors in students. Clinicians should adapt treatment and prevention strategies to help patients transition from insecure attachment to a more secure pattern and regulate their negative emotions.

Keywords: food and alcohol disturbance, attachment, childhood maltreatment, child abuse, drunkorexia

1. Introduction

Food and Alcohol Disturbance (FAD) describes a range of eating disorder behaviors that occur before, during, and/or after alcohol use. These behaviors aim to compensate for alcohol-related calorie intake and/or maximize the psychoactive effects of alcohol (Choquette et al., 2018). FAD has been associated with alcohol use, alcohol-related problems, and disordered eating behaviors (Giles et al., 2009; Gorrell et al., 2019; Hunt & Forbush, 2016; Pietrabissa et al., 2018; Pompili & Laghi, 2018; Rahal et al., 2012; Shepherd et al., 2021). Therefore, FAD is considered a behavior that intersects between alcohol use disorder (AUD) and eating disorders (ED).

Few studies have examined the psychological or affective correlates of FAD (for review, see Shepherd et al., 2021), and none have explored the attachment profile or experiences of child maltreatment. According to Bowlby (1969), attachment patterns develop through repeated interactions between infants and caregivers during times of perceived threat or distress. These patterns shape the child's expectations and behaviors towards others. Attachment relationships remain significant throughout life, influencing adults' expectations and preferences in their interactions with others (Bartholomew & Horowitz, 1991; Bowlby, 1969). The attachment profile can function as a risk or protective factor against emotional problems when other risks are present (Bowlby, 1990), such as mental health issues. *Secure* attachment characterizes individuals who are comfortable with intimacy, have relative autonomy in relationships (Bartholomew & Horowitz, 1991), experience satisfying relationships, regulate their emotions effectively, and maintain coherent mental states and a stable sense of self. In contrast, adults with attachment insecurity often exhibit heightened sensitivity to relationship loss, an incoherent sense of self, preoccupation, leading to anger or passivity, and difficulties regulating their emotional states (Bartholomew & Horowitz, 1991). The *preoccupied* attachment profile, also known as anxious or anxious-ambivalent (Shaver & Hazan, 1987), is

characterized by individuals who feel unworthy but maintain a positive view of others (Main et al., 1985). Lastly, the *fearful* profile, also referred to as dismissing or avoidant (Shaver & Hazan, 1987), is characterized by a sense of unworthiness combined with an expectation that others will hold negative feelings (perceiving them as untrustworthy and rejecting). This attachment style involves avoiding close relationships as a way to protect oneself from anticipated rejection. Attachment security is observed in 58% of the population across various ages, genders, socio-economic statuses, ethnicities, and countries of residence, while preoccupied attachment is found in 19% and fearful attachment in 23% of the population (Bakermans-Kranenburg & van IJzendoorn, 2009).

Secure attachment has consistently been identified as a protective factor against alcohol abuse, while insecure attachment is recognized as a risk factor for AUD (for review see Schindler, 2019). Insecure attachment is associated with higher alcohol use among adolescents, students, and adults (Brennan & Shaver, 1995; Cooper et al., 1998; DeFronzo & Pawlak, 1993; El-Guebaly et al., 1993; McNally et al., 2003; Mickelson et al., 1997; Wedekind et al., 2013) as well as an increased risk of developing AUD (Schindler, 2019; Schindler et al., 2005). AUD is often viewed as a form of “self-medication” and an attempt to compensate for inadequate attachment strategies (Schindler, 2019). Specifically, higher scores on the preoccupied attachment are positively associated with reports of drinking to cope with negative emotions (Brennan & Shaver, 1995). Individuals with a preoccupied profile may use alcohol to facilitate social relationships and alleviate anxiety related to social situations (Schindler, 2019). On the other hand, fearful individuals use alcohol to cope with stress (Zakhour et al., 2020), avoid social contact, and suppress emotions (Schindler, 2019). Similarly, a negative model of self (such as a fearful or preoccupied attachment profile) is associated with greater alcohol-related problems (McNally et al., 2003). Longitudinal studies have shown that persistent heavy and problematic alcohol use among insecure individuals

impairs and may worsen their ability to form close relationships (for review, see Schindler, 2019).

Insecure attachment has also been consistently observed in ED (Barone & Guiducci, 2009; Latzer et al., 2002; Ramacciotti et al., 2001; Raynault et al., 2016; Ward et al., 2000), with a prevalence ranging from 80 to 100% in at-risk- and ED populations (Han & Kahn, 2017; Raynault et al., 2016). Insecure attachment is associated with more unhealthy eating behaviors in the general population (Faber et al., 2018) and more severe ED symptoms in clinical populations (Raynault et al., 2016; Tasca & Balfour, 2014). Specifically, the preoccupied and fearful attachment profiles are linked to eating disorder symptoms in clinical samples (Tasca & Balfour, 2014), with the preoccupied profile being prevalent among patients with anorexia nervosa (Raynault et al., 2016). Among students, ED symptomatology correlates with higher scores on the preoccupied dimension (Brennan & Shaver, 1995; Pace et al., 2012; Suldo & Sandberg, 2000) and fearful dimension (Pace et al., 2012). Additionally, the preoccupied and anxious attachment profiles are highly associated with more severe bulimia and binge eating symptoms in university students (Brennan & Shaver, 1995; Elgin & Pritchard, 2006; Pace et al., 2012). Thus, insecure attachment, characterized by preoccupied and fearful profiles is associated with increased alcohol use, alcohol-related problems, and ED symptoms in student and clinical populations.

On the other hand, several studies indicate that childhood maltreatment is associated with more severe alcohol use in students (Schwartz et al., 2023; Tonmyr et al., 2010) and is a risk factor for AUD (Makhija & Sher, 2007) or ED (Jacobi et al., 2004). Childhood maltreatment encompasses a wide range of interpersonal victimization experienced during childhood, including *sexual abuse* often perpetrated by someone in a position of authority, *physical abuse* involving interpersonal violence typically inflicted by a parent or authority figure, and *emotional or psychological abuse*, which includes instances of criticism, rejection, and

humiliation (Myers et al., 2002). The effects of childhood abuse can be multifaceted, such as the inability to endure emotional states, especially negative ones, leading to psychological distress, and can extend well into adulthood (Chapman et al., 2007; Dembo et al., 1990; Gilbert et al., 2009).

Childhood maltreatment has been primarily associated with an increased risk of developing AUD in adulthood (Cicchetti & Handley, 2019; DeFronzo & Pawlak, 1993; Guastaferrero et al., 2023). A history of physical abuse is linked to higher alcohol use (Le et al., 2018) among high-risk youths (Dembo et al., 1990; Neumark-Sztainer et al., 1997), and both physical and sexual abuse histories are associated with a 2-fold increased risk of developing AUD (Halpern et al., 2018; Tonmyr et al., 2010). Similarly, experiencing physical abuse before the age of 12 is associated with an elevated risk of developing AUD in early adulthood (Dubowitz et al., 2021).

Childhood maltreatment is considered a non-specific risk factor for ED (Arango et al., 2021; Solmi et al., 2022; Treasure et al., 2022). Emotional abuse appears to play an important role in ED, associated with more severe symptoms, (especially purging, and an earlier age of onset of the disorder (Guillaume et al., 2016; Monteleone et al., 2021, 2021). Among female university students, childhood emotional abuse showed the strongest association with ED symptoms (Burns et al., 2012). In clinical samples, emotional abuse in women with ED was linked to drive for thinness and bulimia through alexithymia (Barone et al., 2023). The authors suggest that individuals who experienced early emotional abuse may develop ED symptoms as a way to cope with distorted emotional perceptions (Barone et al., 2023). Thus, childhood maltreatment, particularly sexual, emotional, and physical abuse, is associated with increased alcohol use and a heightened risk of AUD or ED in adulthood.

In the literature, attachment insecurity and childhood maltreatment co-occur in students with heavy alcohol use and eating disorders symptoms, as well as in patients with AUD or ED. A

study has shown that attachment anxiety mediates the relationship between childhood adversity and harmful drinking in adults (Le et al., 2018). In a clinical sample of individuals with eating ED, both preoccupied and fearful attachment styles equally mediate the relationship between childhood maltreatment and eating disorder symptoms (Tasca et al., 2013). These findings support the idea that insecure attachment may explain how childhood maltreatment can contribute to alcohol abuse and eating disorders in adulthood.

Study overview

Despite abundant literature on attachment and childhood maltreatment in students with heavy alcohol use or eating disorders symptoms, the attachment profile, childhood maltreatment, and their relationships with FAD behaviors have not been explored to date. Only one study has shown that a history of traumatic events and post-traumatic stress disorder symptoms is positively associated with FAD (Michael & Witte, 2021), supporting the link between trauma and FAD. Further investigation is needed to better understand how childhood maltreatment and attachment may contribute to FAD behaviors. Attachment insecurity, unlike a childhood history of maltreatment, may be amenable to change and thus could be a target for prevention and support for individuals with FAD. Identifying attachment insecurity as a mediator between childhood maltreatment and FAD could facilitate personalized interventions based on attachment profiles and help individuals regulate FAD behaviors.

Thus, the current study aims to investigate the potential effects of insecure attachment and childhood maltreatment on FAD behaviors in university students. Drawing from the literature on AUD and ED populations, insecure attachment was conceptualized using preoccupied and fearful profiles, while childhood maltreatment included sexual, physical, and emotional abuse. The mediated effect of childhood maltreatment through attachment on FAD was tested using structural equation modeling in university students.

2. Method

2.1. Participants

Four hundred and one volunteer students at the University of Caen Normandy were included in the present study between 2022 and 2023. They were recruited based on their willingness and individually invited to a laboratory room to fill out questionnaires. All participants were aged between 18 and 36 years (19.9 ± 1.75), of both genders (men $N= 128$, women $N= 273$), and were native French speakers. All participants were alcohol consumers (i.e. had consumed alcohol in the last 12 months) but they were asked to abstain for at least 12 hours before the examination.

All participants were informed about the study before their inclusion and provided written informed consent. The study adhered to the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (American Psychological Association, 2016) for the ethical treatment of human participants. The study was notified and authorized by the “National Commission for Information Technology and Civil Liberties” under the number u24-20171109-01R1.

2.2. Measures

Descriptive statistics for all measures listed below are presented in Table 1.

2.2.1. Food and Alcohol Disturbance (FAD)

FAD was assessed using the French version of the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS; Ritz et al., 2023). The CEBRACS aims to investigate compensatory eating behaviors related to alcohol consumption over the past three months, intended to compensate for alcohol-related calorie intake and/or enhance the

intoxicative effects of alcohol. Participants were asked to rate the frequency of each behavior (1 = never; 2 = rarely (approximately 25% on occasions); 3 = sometimes (approximately 50% on occasions); 4 = often (approximately 75% on occasions); 5 = nearly always) for three time periods: before drinking, while under the effects of alcohol (during drinking), and after the effects of alcohol wore off (after drinking). The CEBRACS yields a total score ranging from 21 to 105 points (Cronbach α 0.91) and consists of four subscales: “alcohol effects” (7 items; Cronbach α 0.96); “dietary restraint and exercising” (7 items; Cronbach α 0.90), “purging” (5 items; Cronbach α 0.65) and “extreme fasting and vomiting” (2 items; Cronbach α 0.73).

2.2.2. Attachment

The participants' attachment style was assessed using the French version of the Relationship Scales Questionnaire (RSQ; Guédénéy et al., 2010). Adapted from the Relationship Questionnaire (Bartholomew & Horowitz, 1991) and the Adult attachment Scale (Collins & Read, 1990), the RSQ is the most commonly used questionnaire for assessing different attachment styles (Griffin & Bartholomew, 1994). The RSQ consists of short statements, and individuals rated their responses on a five-point Likert scale (“not at all like me” = 1 point to “exactly like me” = 5 points). The attachment *preoccupied* subscale (3 items; Cronbach α 0.55) assesses feelings of insecurity, anxiety, emotional instability, worry about being abandoned by significant others, and a tendency to perceive all situations as threatening. The *fearful* subscale (4 items; Cronbach α 0.57) assesses a desire for intimacy with significant others, along with perceived difficulty in depending on and trusting them due to a negative self-image and perception of others. Scores for each attachment pattern are derived by calculating the mean score of the corresponding items, with higher scores indicating greater levels of attachment.

2.2.3. *Childhood maltreatment*

Childhood maltreatment was assessed using the Childhood Trauma Questionnaire (CTQ; Bernstein et al., 1994). The CTQ is a questionnaire with subscales that measure different subtypes of childhood trauma experiences: emotional abuse (5 items; Cronbach α 0.78), physical abuse (5 items; Cronbach α 0.82) and sexual abuse (5 items; Cronbach α 0.70). All items are 5-point Likert-type questions (from “never true” to “very often true”), with higher scores indicating greater levels of childhood trauma experiences. The French version of the CTQ has been demonstrated to have a good reliability and validity (Paquette et al., 2004).

2.3. Statistical analyses

The data were not normally distributed, as assessed by skewness and kurtosis parameters (all values $> |2|$) and Shapiro wilk tests (all p values < 0.001).

In all participants, the relationships between FAD, attachment, and childhood maltreatment measures were assessed using Spearman’s rho coefficient (two-tailed). Subsequent analyses were conducted to test the hypothesized structural model represented in Figure 1. The CEBRACS subscales were treated as the latent FAD factor, while the fearful attachment subscale and preoccupied attachment subscale of the RSQ were treated as the latent insecurity attachment factor. The sexual abuse, physical abuse, and emotional abuse subscales of the CTQ were considered as the latent childhood maltreatment factor. Confirmatory factor analysis (CFA) was employed to test the fit of the measurement model and assess relationships with FAD, attachment and childhood maltreatment factors (Figure 1). Criteria for acceptable model fit included χ^2 , Comparative Fit index (CFI) greater than .95, and standardized root mean squared residual (SRMSR) of 0.08 or less. Variables contributing significantly to each factor were identified with a p value ≤ 0.001 .

Structural Equation Modeling (SEM) was then tested in all participants (N=401) because the CEBRACS, RSQ, and, CTQ scales provide scores representing the full range of frequency or severity of behaviors. For each scale, a higher score indicates greater frequency or severity of the behavior. According to Bartholomew & Horowitz, (1991), the attachment subscales were not designed to be used categorically; rather, each sub-score reflects the extent to which the individual perceives themselves as corresponding to a particular attachment style. SEM was conducted using the Diagonally Weighted Least Squares method (DWLS) because measures were obtained from ordinal scales and were non-normally distributed (DiStefano & Morgan, 2014; Mîndrilă, 2010), with FAD measures as the latent endogenous variable and attachment and childhood maltreatment as the latent exogenous variables. All variables entered into the model were standardized before estimation to ensure equal weighting. Criteria for acceptable model fit included χ^2 , a CFI greater than .95, a SRMSR of 0.08 or less, a root mean square error of approximation (RMSEA) of 0.08 or less, and a Bentler-Bonett Non-normed fit index (NNFI) greater than .60. The indirect effect (i.e. mediated effects) between childhood maltreatment and attachment on FAD was tested using the following defined path: childhood maltreatment * attachment ~ FAD. To obtain more accurate parameters, bootstrapping (1000 replicates) was used with an adjusted bias-corrected method (Tibbe & Montoya, 2022). The indirect effect is statistically significant at $p \leq .05$ if the 95% CI for the estimate does not include zero (Shrout & Bolger, 2002).

3. Results

Relationships between FAD, attachment, and childhood maltreatment measures assessed with Spearman's rho coefficients are presented in Table 1. The CEBRACS subscales were correlated with each other with small to medium effect sizes (from $\rho=0.15$ to 0.40). The RSQ fearful subscale was correlated with the RSQ preoccupied subscale with a small effect

size ($\rho = 0.28$). The CTQ physical, emotional, and sexual abuse subscales were correlated with each other with small to medium effect sizes (from $\rho = 0.23$ to 0.38). The RSQ subscales were positively correlated with the CTQ subscales, with small to medium effect sizes, except for the relationships between the RSQ preoccupied subscale and both the CTQ physical and sexual abuse subscales. The CEBRACS “alcohol” subscale was positively correlated with both the RSQ fearful and preoccupied subscales with small effect sizes. The CEBRACS “dietary restraint and exercising” subscale was positively correlated with the CTQ emotional abuse subscale with small effect size. The CEBRACS “purging” subscale was positively correlated with the RSQ preoccupied subscale and both the CTQ sexual and emotional subscales with small effect sizes. The CEBRACS “extreme” subscale was positively correlated with the RSQ preoccupied subscale and the CTQ emotional abuse subscale with small effect sizes.

The CFA conducted to test the fit of the measurement model and assess relationships with FAD, attachment, and childhood maltreatment factors showed that the measurement model was an excellent fit to the data ($\chi^2 = 30.2$; $p = 0.18$; CFI = 0.99 and SRMR = 0.02 (90% CI [0.01-0.05])). All the CEBRACS subscales (“alcohol enhancement”, “dietary and exercising”, “purging”, and “extreme fasting and vomiting”), the attachment subscales (fearful and preoccupied), and the childhood maltreatment subscales (emotional abuse, physical abuse, and sexual abuse) were highly correlated with the FAD factor, the attachment factor, and the childhood maltreatment factor, respectively (all p values < 0.001). Figure 1 shows the latent factors with standardized coefficients of the variables. Furthermore, the results of the CFA also showed that the FAD factor was positively correlated with the attachment factor ($\beta = 0.19$, $p = 0.04$), and the attachment factor was positively correlated with the childhood maltreatment factor ($\beta = 0.39$, $p < 0.001$).

Results of the SEM showed a good fit for the data ($\chi^2 = 28.2$; $p=0.25$; SRMR = 0.04; RMSEA = 0.02; 95% IC [0.01-0.05]; CFI = 0.97 and NNFI = 0.96), with significant modeled path coefficients and covariance, except for the path coefficient from childhood maltreatment to FAD ($\beta= -0.10$ (95% CI [-0.20;0.01]; $p =0.09$) (Figure 2). The Tucker-Lewis Index (TLI), an index that takes into account the number of parameters and sample size (Tucker & Lewis, 1973) in contrast to the NNFI (Bentler & Bonett, 1980), also shows an excellent fit (value = 0.96). The bootstrap method (1000 replicates) with adjusted bias-corrected (Tibbe & Montoya, 2022) was used to test the indirect effect in the model with the path: childhood maltreatment * attachment ~ FAD. The findings showed that the indirect effect of attachment on FAD, mediated by childhood maltreatment, was significant ($\beta= 0.10$ (95% CI [0.01-0.19], $p=0.047$).

4. Discussion

The aims of the present study were to investigate the relationships between insecure attachment and childhood maltreatment on FAD, as well as the potential mediating effect of childhood maltreatment on FAD behaviors through insecure attachment.

Results of the SEM conducted with all participants using measures of attachment, childhood maltreatment, and FAD indicate that attachment insecurity is directly associated with the frequency of FAD behaviors, but not childhood maltreatment.

This first finding is consistent with previous studies showing relationships between insecure attachment and alcohol use (Brennan & Shaver, 1995; Cooper et al., 1998; DeFronzo & Pawlak, 1993; El-Guebaly et al., 1993; McNally et al., 2003; Mickelson et al., 1997; Wedekind et al., 2013), as well as eating disorders in adulthood. Indeed, individuals with a fearful attachment style are more likely to engage in bulimia and binge eating behaviours (Brennan & Shaver, 1995; Elgin & Pritchard, 2006; Pace et al., 2012), and may use alcohol to

cope with stressful situations (Zakhour et al., 2020) or to avoid social contacts (Schindler, 2019). On the other hand, the preoccupied profile is more associated with symptoms of anorexia nervosa, and these preoccupied individuals may use alcohol to cope with negative emotions (Brennan & Shaver, 1995). Thus, university students with insecure attachment style may engage in FAD behaviours to facilitate social relationships, minimize fear about intimacy, and cope with anxious situations. Overall, our results are consistent with a meta-analytic review demonstrating that higher attachment insecurity, particularly the preoccupied and fearful styles, is associated with more unhealthy eating behaviors in adults, regardless of the specific type (purging or dietary restraint) (Faber et al., 2018). Using the same SEM analysis approach, a study has shown that in patients with ED, insecure attachment was associated with more symptoms of dietary restraint, eating concerns, and weight concerns (Tasca et al., 2013). Concerning alcohol use, an association was found between preoccupied attachment and harmful drinking in adults (Le et al., 2018). More broadly, preoccupied attachment is related to increased risky behaviors in adulthood (Cooper et al., 1998). Our results indicate that students with insecure attachment profile more frequently engage in FAD behaviors and suggest that they may be at higher risk of severe alcohol use and disordered eating. These students may also engage in FAD behaviors to feel part of a group (given the high prevalence of FAD among students), driven by concerns about abandonment and to better manage their fear of intimacy in relationships (Shaver & Hazan, 1987), potentially leading to quicker and heavier drinking .

However, our results have shown that a history of child abuse was not associated with FAD, contrary to the literature that demonstrates relationships between childhood maltreatment and more severe alcohol use (Schwartz et al., 2023; Tonmyr et al., 2010) or symptoms of ED (Burns et al., 2012) in university students. A history of child abuse is indirectly associated with FAD through attachment insecurity. These findings support a model in which insecure

attachment not only directly impacts FAD, but childhood maltreatment also partly explains its impact through attachment on adult behaviors. This model explains how early experiences of child maltreatment can influence attachment profiles and subsequent behaviors related to FAD.

The main result of the present study is the indirect effect of childhood maltreatment on FAD through insecure attachment. This finding aligns with studies demonstrating that insecure attachment mediates the relationship between childhood adversity and harmful drinking (Le et al., 2018) or symptoms of eating disorder (Tasca et al., 2013). Our results support the evidence that childhood maltreatment may contribute to more frequent FAD behaviors in adulthood by negatively impacting attachment profiles. Another study has shown that PTSD symptoms predict purging, restriction, and other compensatory behaviors related to alcohol-induced weight management in students (Michael & Witte, 2021). According to the authors, students experiencing symptoms of traumatic stress may resort to these maladaptive strategies to offset caloric intake in response to alcohol consumption due to inadequate coping mechanisms or other anxiety-related issues. Additionally, individuals who have experienced early emotional abuse may develop symptoms of eating disorders as a way to cope with distorted emotional perceptions (Barone et al., 2023). Therefore, amidst emotional turmoil, students may feel compelled to compensate for alcohol consumption to maintain stability in weight and shape. These previous studies support our results, demonstrating the indirect relationship between childhood maltreatment and FAD through attachment insecurity, which is characterized by individuals experiencing difficulties in regulating their affective states (Bartholomew & Horowitz, 1991). Abuse during childhood may alter the developmental trajectory and compromise attachment quality. Our findings are also consistent with evidence suggesting that childhood maltreatment and early dysfunctional family functioning impact

adult attachment later in life (Bakermans-Kranenburg & van IJzendoorn, 2009), as well as deviant behaviors such as FAD.

Clinical implications

These findings have several clinical implications and may contribute to the development of prevention and treatment strategies. First, they encourage assessing attachment styles and inquiring about adverse childhood experiences to tailor support for students engaged in FAD behaviors. Indeed, a history of sexual abuse (Paolucci et al., 2001) and FAD behaviors (Shepherd et al., 2021) are more likely to be associated with poor academic performance, highlighting the need for early intervention to prevent academic failure. Moreover, focusing on differential attachment functioning could lead to tailored treatments based on assessments of both attachment and childhood maltreatment. Adults with insecure attachment tend to use less adaptive coping styles than those with secure attachment (Seiffge-Krenke, 2006) and experience poorer friendship quality (Khan et al., 2020). Therefore, guidance focused on improving coping strategies and developing high-quality friendships with secure attachment figures may reduce FAD behaviors. More precisely, preoccupied individuals with a history of childhood abuse should receive management of emotional states with a method that helps to down-regulate emotions (Slade & Holmes, 2019), along with support aimed at promoting independence in relation to others and improving self-esteem. Therapists should emphasize the development of cognitive reflection skills for these preoccupied individuals, enhancing emotional attunement and regulation. This involves learning to identify, label, and experience emotions safely (Berry & Danquah, 2016; Daniel, 2006; Levy et al., 2011). Such therapy can help modify maladaptive beliefs about self-worth and fear of abandonment (Berry & Danquah, 2016). On the other hand, fearful individuals with a history of childhood abuse should benefit from an approach designed to regulate their affective states and expressions (navigating between emotional escalation and avoidance) and fostering confidence in their

relationships with others. Due to their attachment style and experiences of childhood maltreatment, fearful individuals are more likely to perceive others as threatening and experience greater loneliness, which can exacerbate their psychological and emotional distress. In this context, the qualities of the therapist are essential for the development of a secure attachment relationship, enabling a space for gradual and appropriate emotional expression (Berry & Danquah, 2016). Given the persistent nature of childhood maltreatment experiences and individuals' lived experiences, intervening with attachment profiles may be a more appropriate therapeutic strategy to address the challenges faced by these individuals (Slade & Holmes, 2019) and mitigate the onset and severity of FAD behaviors resulting from such maltreatment backgrounds and insecure attachments. Since attachment patterns are dynamic and can change in adolescence (Khan et al., 2020) and adulthood (Berry & Danquah, 2016), therapeutic strategies aimed at fostering a shift from insecure to a more secure pattern should be considered (Taylor et al., 2015).

Limitations

This study has several limitations. First, the poor Cronbach alphas for the attachment measure (specifically the fearful and preoccupied subscales) may be attributed to the limited number of items used to assess attachment style. However, the Relationship Scales Questionnaire (Bartholomew & Horowitz, 1991) is among the most commonly used instruments for evaluating various attachment styles (Griffin & Bartholomew, 1994). Additionally, although participants were queried about their history of childhood abuse, the data were collected during adulthood and were cross-sectional. Future research that incorporates measures of childhood maltreatment, attachment style, and FAD behaviors across different stages of a child's development, with longitudinal follow-up, could provide better insight into the developmental causality of the relationships among these variables. It is noteworthy that

conducting such a longitudinal study, with multiple measures obtained from the same cohort over several years, is challenging.

Conclusion

In conclusion, the present study demonstrates a direct effect of attachment insecurity and an indirect effect of childhood maltreatment on FAD behaviors in adult students. The findings underscore how early experiences of child maltreatment, particularly sexual, physical, and emotional abuse, may adversely impact attachment styles characterized by fearful or preoccupied attachment, and subsequently contribute to FAD behaviors in adulthood among students. From a clinical perspective, these findings suggest that assessing attachment functioning and childhood maltreatment is crucial in individuals exhibiting FAD, to tailor appropriate treatment and prevention strategies. FAD may be considered, at least, a possible consequence of childhood abuse, especially in individuals with attachment insecurity (fearful or preoccupied styles). Further studies are needed to more precisely characterize the nature and the role of a history of childhood abuse in the attachment insecurity profile, particularly concerning various motives and behaviors of FAD. Longitudinal studies would allow us to better clarify the developmental causality of childhood maltreatment on attachment style and FAD, as well as its medium-term consequences regarding the risk of developing AUD or ED.

5. Acknowledgments

This work was supported by RIN Normandie (Region of Normandy, France) and the Fondation pour la Recherche en Alcoologie (FRA).

6. Data availability

Data and measurements are available at : <https://osf.io/4h9tj>

Identifier: DOI 10.17605/OSF.IO/4H9TJ

7. Author contributions

All authors have approved the final manuscript.

L. Ritz: data analyses, writing original draft, formal analysis; N. Mauny: project administration, investigation; C. Montcharmont: project administration, investigation; N. Dessommes: contributed to writing the introduction; D. Jacquet: conceptualization, review and editing of the original draft, supervision; M. Lemerrier-Dugarin: review and editing of the original draft, supervision.

8. Disclosure statement

The authors declare no conflict of interest.

9. References

- American Psychological Association. (2016). Revision of Ethical Standard 3.04 of the “Ethical Principles of Psychologists and Code of Conduct” (2002, as amended 2010). *American Psychologist*, 71, 900- 900. <https://doi.org/10.1037/amp0000102>
- Arango, C., Dragioti, E., Solmi, M., Cortese, S., Domschke, K., Murray, R. M., Jones, P. B., Uher, R., Carvalho, A. F., Reichenberg, A., Shin, J. I., Andreassen, O. A., Correll, C. U., & Fusar-Poli, P. (2021). Risk and protective factors for mental disorders beyond genetics : An evidence-based atlas. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 20(3), 417- 436. <https://doi.org/10.1002/wps.20894>
- Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2009). The first 10,000 Adult Attachment Interviews : Distributions of adult attachment representations in clinical and non-clinical groups. *Attachment & Human Development*, 11(3), 223- 263. <https://doi.org/10.1080/14616730902814762>
- Barone, E., Carfagno, M., Cascino, G., Landolfi, L., Colangelo, G., Della Rocca, B., & Monteleone, A. M. (2023). Childhood maltreatment, alexithymia and eating disorder psychopathology : A mediation model. *Child Abuse & Neglect*, 146, 106496. <https://doi.org/10.1016/j.chiabu.2023.106496>
- Barone, L., & Guiducci, V. (2009). Mental representations of attachment in Eating Disorders : A pilot study using the Adult Attachment Interview. *Attachment & Human Development*, 11(4), 405- 417. <https://doi.org/10.1080/14616730902814770>
- Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults : A test of a four-category model. *Journal of Personality and Social Psychology*, 61(2), 226- 244. <https://doi.org/10.1037//0022-3514.61.2.226>

- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88(3), 588- 606. <https://doi.org/10.1037/0033-2909.88.3.588>
- Bernstein, D. P., Fink, L., Handelsman, L., & Foote, J. (1994). *Childhood Trauma Questionnaire (CTQ)*. <https://doi.org/10.1037/t02080-000>
- Berry, K., & Danquah, A. (2016). Attachment-informed therapy for adults : Towards a unifying perspective on practice. *Psychology and Psychotherapy: Theory, Research and Practice*, 89(1), 15- 32. <https://doi.org/10.1111/papt.12063>
- Bowlby, J. (1969). *Attachment and loss : Volume 1 : Attachment* (NY: Basic Books).
- Bowlby, J. (1990). *A Secure Base* (Reprint édition). Basic Books.
- Brennan, K. A., & Shaver, P. R. (1995). Dimensions of adult attachment, affect regulation, and romantic relationship functioning. *Personality and Social Psychology Bulletin*, 21(3), 267- 283. <https://doi.org/10.1177/0146167295213008>
- Burns, E. E., Fischer, S., Jackson, J. L., & Harding, H. G. (2012). Deficits in emotion regulation mediate the relationship between childhood abuse and later eating disorder symptoms. *Child Abuse & Neglect*, 36(1), 32- 39. <https://doi.org/10.1016/j.chiabu.2011.08.005>
- Chapman, D., Dube, S., & Anda, R. (2007). Adverse Childhood Events as Risk Factors for Negative Mental Health Outcomes. *Psychiatric Annals*, 37(5), 00485713-20070501- 20070507. <https://doi.org/10.3928/00485713-20070501-07>
- Choquette, E. M., Rancourt, D., & Kevin Thompson, J. (2018). From fad to FAD : A theoretical formulation and proposed name change for « drunkorexia » to food and alcohol disturbance (FAD). *The International Journal of Eating Disorders*, 51(8), 831- 834. <https://doi.org/10.1002/eat.22926>

- Cicchetti, D., & Handley, E. D. (2019). Child maltreatment and the development of substance use and disorder. *Neurobiology of Stress*, *10*, 100144. <https://doi.org/10.1016/j.ynstr.2018.100144>
- Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology*, *58*(4), 644- 663. <https://doi.org/10.1037//0022-3514.58.4.644>
- Cooper, M. L., Shaver, P. R., & Collins, N. L. (1998). Attachment styles, emotion regulation, and adjustment in adolescence. *Journal of Personality and Social Psychology*, *74*(5), 1380- 1397. <https://doi.org/10.1037/0022-3514.74.5.1380>
- Daniel, S. I. F. (2006). Adult attachment patterns and individual psychotherapy : A review. *Clinical Psychology Review*, *26*(8), 968- 984. <https://doi.org/10.1016/j.cpr.2006.02.001>
- DeFronzo, J., & Pawlak, R. (1993). Effects of social bonds and childhood experiences on alcohol abuse and smoking. *The Journal of Social Psychology*, *133*(5), 635- 642. <https://doi.org/10.1080/00224545.1993.9713918>
- Dembo, R., Williams, L., Voie, L. L., Schmeidler, J., Kern, J., Getreu, A., Berry, E., Genung, L., & Wish, E. D. (1990). A Longitudinal Study of the Relationships Among Alcohol Use, Marijuana/Hashish Use, Cocaine Use, and Emotional/Psychological Functioning Problems in a Cohort of High-Risk Youths. *International Journal of the Addictions*, *25*(11), 1341- 1382. <https://doi.org/10.3109/10826089009056224>
- DiStefano, C., & Morgan, G. B. (2014). A Comparison of Diagonal Weighted Least Squares Robust Estimation Techniques for Ordinal Data. *Structural Equation Modeling: A Multidisciplinary Journal*, *21*(3), 425- 438. <https://doi.org/10.1080/10705511.2014.915373>

- Dubowitz, H., Roesch, S., & Lewis, T. (2021). Child Maltreatment, Early Adult Substance Use, and Mediation by Adolescent Behavior Problems. *Child Maltreatment*, 26(2), 238- 248. <https://doi.org/10.1177/1077559520941919>
- Elgin, J., & Pritchard, M. (2006). Adult attachment and disordered eating in undergraduate men and women. *Journal of College Student Psychotherapy*, 21(2), 25- 40. https://doi.org/10.1300/J035v21n02_05
- El-Guebaly, N., West, M., Maticka-Tyndale, E., & Pool, M. (1993). Attachment among adult children of alcoholics. *Addiction*, 88(10), 1405- 1411. <https://doi.org/10.1111/j.1360-0443.1993.tb02027.x>
- Faber, A., Dubé, L., & Knäuper, B. (2018). Attachment and eating : A meta-analytic review of the relevance of attachment for unhealthy and healthy eating behaviors in the general population. *Appetite*, 123, 410- 438. <https://doi.org/10.1016/j.appet.2017.10.043>
- Gilbert, R., Widom, C. S., Browne, K., Fergusson, D., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *Lancet (London, England)*, 373(9657), 68- 81. [https://doi.org/10.1016/S0140-6736\(08\)61706-7](https://doi.org/10.1016/S0140-6736(08)61706-7)
- Giles, S. M., Champion, H., Sutfin, E. L., McCoy, T. P., & Wagoner, K. (2009). Calorie restriction on drinking days : An examination of drinking consequences among college students. *Journal of American College Health: J of ACH*, 57(6), 603- 609. <https://doi.org/10.3200/JACH.57.6.603-610>
- Gorrell, S., Walker, D. C., Anderson, D. A., & Boswell, J. F. (2019). Gender differences in relations between alcohol-related compensatory behavior and eating pathology. *Eating and Weight Disorders: EWD*, 24(4), 715- 721. <https://doi.org/10.1007/s40519-018-0545-7>

- Griffin, D. W., & Bartholomew, K. (1994). Models of the self and other : Fundamental dimensions underlying measures of adult attachment. *Journal of Personality and Social Psychology*, 67(3), 430- 445. <https://doi.org/10.1037/0022-3514.67.3.430>
- Guastafarro, K., Linden-Carmichael, A. N., & Chiang, S.-C. (2023). Association Between Child Maltreatment and Substance Use Disorder Across Emerging Adulthood. *Child Maltreatment*, 10775595231154545. <https://doi.org/10.1177/10775595231154545>
- Guédéney, N., Fermanian, J., & Bifulco, A. (2010). La version française du Relationship Scales Questionnaire de Bartholomew (RSQ, Questionnaire des échelles de relation) : Étude de validation du construit. *L'Encéphale*, 36(1), 69- 76. <https://doi.org/10.1016/j.encep.2008.12.006>
- Guillaume, S., Jaussent, I., Maimoun, L., Ryst, A., Seneque, M., Villain, L., Hamroun, D., Lefebvre, P., Renard, E., & Courtet, Ph. (2016). Associations between adverse childhood experiences and clinical characteristics of eating disorders. *Scientific Reports*, 6, 35761. <https://doi.org/10.1038/srep35761>
- Halpern, S. C., Schuch, F. B., Scherer, J. N., Sordi, A. O., Pachado, M., Dalbosco, C., Fara, L., Pechansky, F., Kessler, F., & Von Diemen, L. (2018). Child Maltreatment and Illicit Substance Abuse : A Systematic Review and Meta-Analysis of Longitudinal Studies. *Child Abuse Review*, 27(5), 344- 360. <https://doi.org/10.1002/car.2534>
- Han, S., & Kahn, J. H. (2017). Attachment, Emotion Regulation Difficulties, and Disordered Eating Among College Women and Men. *The Counseling Psychologist*, 45(8), 1066- 1090. <https://doi.org/10.1177/0011000017744884>
- Hunt, T. K., & Forbush, K. T. (2016). Is “drunkorexia” an eating disorder, substance use disorder, or both? *Eating Behaviors*, 22, 40- 45. <https://doi.org/10.1016/j.eatbeh.2016.03.034>

- Jacobi, C., Hayward, C., de Zwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders : Application of risk terminology and suggestions for a general taxonomy. *Psychological Bulletin*, *130*(1), 19- 65. <https://doi.org/10.1037/0033-2909.130.1.19>
- Khan, F., Chong, J. Y., Theisen, J. C., Fraley, R. C., Young, J. F., & Hankin, B. L. (2020). Development and change in attachment : A multiwave assessment of attachment and its correlates across childhood and adolescence. *Journal of Personality and Social Psychology*, *118*(6), 1188- 1206. <https://doi.org/10.1037/pspi0000211>
- Latzer, Y., Hochdorf, Z., Bachar, E., & Canetti, L. (2002). Attachment Style and Family Functioning as Discriminating Factors in Eating Disorders. *Contemporary Family Therapy*, *24*(4), 581- 599. <https://doi.org/10.1023/A:1021273129664>
- Le, T. L., Levitan, R. D., Mann, R. E., & Maunder, R. G. (2018). Childhood Adversity and Hazardous Drinking : The Mediating Role of Attachment Insecurity. *Substance Use & Misuse*, *53*(8), 1387- 1398. <https://doi.org/10.1080/10826084.2017.1409764>
- Levy, K. N., Ellison, W. D., Scott, L. N., & Bernecker, S. L. (2011). Attachment style. *Journal of Clinical Psychology*, *67*(2), 193- 203. <https://doi.org/10.1002/jclp.20756>
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in Infancy, Childhood, and Adulthood : A Move to the Level of Representation. *Monographs of the Society for Research in Child Development*, *50*(1/2), 66- 104. <https://doi.org/10.2307/3333827>
- Makhija, N., & Sher, L. (2007). Childhood abuse, adult alcohol use disorders and suicidal behaviour. *QJM: An International Journal of Medicine*, *100*(5), 305- 309. <https://doi.org/10.1093/qjmed/hcm024>
- McNally, A. M., Palfai, T. P., Levine, R. V., & Moore, B. M. (2003). Attachment dimensions and drinking-related problems among young adults : The mediational role of coping

- motives. *Addictive Behaviors*, 28(6), 1115- 1127. [https://doi.org/10.1016/s0306-4603\(02\)00224-1](https://doi.org/10.1016/s0306-4603(02)00224-1)
- Michael, M. L., & Witte, T. H. (2021). Traumatic stress and alcohol-related disordered eating in a college sample. *Journal of American College Health*, 69(7), 806- 811. <https://doi.org/10.1080/07448481.2019.1706534>
- Mickelson, K. D., Kessler, R. C., & Shaver, P. R. (1997). Adult attachment in a nationally representative sample. *Journal of Personality and Social Psychology*, 73(5), 1092- 1106. <https://doi.org/10.1037/0022-3514.73.5.1092>
- Mîndrilă, D. (2010). Maximum Likelihood (ML) and Diagonally Weighted Least Squares (DWLS) Estimation Procedures : A Comparison of Estimation Bias with Ordinal and Multivariate Non-Normal Data. *International Journal for Digital Society*, 1(1). <https://doi.org/10.20533/ijds.2040.2570.2010.0010>
- Monteleone, A. M., Cascino, G., Ruzzi, V., Pellegrino, F., Patriciello, G., Barone, E., Carfagno, M., Monteleone, P., & Maj, M. (2021). Emotional traumatic experiences significantly contribute to identify a maltreated ecophenotype sub-group in eating disorders : Experimental evidence. *European Eating Disorders Review*, 29(2), 269- 280. <https://doi.org/10.1002/erv.2818>
- Myers, J. E. B., Berliner, L., Briere, J., Hendrix, C. T., Reid, T., & Jenny, C. (2002). *The APSAC Handbook on Child Maltreatment*. SAGE Publications.
- Neumark-Sztainer, D., Story, M., French, S. A., & Resnick, M. D. (1997). Psychosocial correlates of health compromising behaviors among adolescents. *Health Education Research*, 12(1), 37- 52. <https://doi.org/10.1093/her/12.1.37>
- Pace, U., Cacioppo, M., & Schimmenti, A. (2012). The moderating role of father's care on the onset of binge eating symptoms among female late adolescents with insecure

- attachment. *Child Psychiatry and Human Development*, 43(2), 282- 292.
<https://doi.org/10.1007/s10578-011-0269-7>
- Paolucci, E. O., Genuis, M. L., & Violato, C. (2001). A Meta-Analysis of the Published Research on the Effects of Child Sexual Abuse. *The Journal of Psychology*, 135(1), 17- 36. <https://doi.org/10.1080/00223980109603677>
- Paquette, D., Laporte, L., Bigras, M., & Zoccolillo, M. (2004). [Validation of the French version of the CTQ and prevalence of the history of maltreatment]. *Sante Mentale Au Quebec*, 29(1), 201- 220. <https://doi.org/10.7202/008831ar>
- Pietrabissa, G., Rossi, A., Gaudenzi, M., Bertuzzi, V., Tagliagambe, A., Volpi, C., Manzoni, G. M., Cattivelli, R., Mannarini, S., Castelnuovo, G., & Simpson, S. (2018). Drunkorexia : Empirical investigation and analysis of the characteristics of the phenomenon in an Italian sample of adolescents and young adults. *Psychology, Society & Education*, 10(3), 285- 299. <https://doi.org/10.25115/psye.v10i3.2135>
- Pompili, S., & Laghi, F. (2018). Drunkorexia : Disordered eating behaviors and risky alcohol consumption among adolescents. *Journal of Health Psychology*, 1359105318791229. <https://doi.org/10.1177/1359105318791229>
- Rahal, C. J., Bryant, J. B., Darkes, J., Menzel, J. E., & Thompson, J. K. (2012). Development and validation of the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS). *Eating Behaviors*, 13(2), 83- 87. <https://doi.org/10.1016/j.eatbeh.2011.11.001>
- Ramacciotti, A., Sorbello, M., Pazzagli, A., Vismara, L., Mancone, A., & Pallanti, S. (2001). Attachment processes in eating disorders. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 6(3), 166- 170. <https://doi.org/10.1007/BF03339766>
- Raynault, A., Rousselet, M., Acier, D., & Grall-Bronnec, M. (2016). Caractéristiques associées à l'attachement insécuré dans l'anorexie mentale. *Annales Médico-*

psychologiques, revue psychiatrique, 174(6), 431- 435.

<https://doi.org/10.1016/j.amp.2015.01.012>

Ritz, L., Mauny, N., Leconte, P., & Margas, N. (2023). French validation of the Compensatory Eating and Behaviors in Response to Alcohol Consumption Scale (CEBRACS) in a university student sample. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 28(1), 95. <https://doi.org/10.1007/s40519-023-01622-8>

Schindler, A. (2019). Attachment and Substance Use Disorders—Theoretical Models, Empirical Evidence, and Implications for Treatment. *Frontiers in Psychiatry*, 10, 727. <https://doi.org/10.3389/fpsyt.2019.00727>

Schindler, A., Thomasius, R., Sack, P.-M., Gemeinhardt, B., Küstner, U., & Eckert, J. (2005). Attachment and substance use disorders : A review of the literature and a study in drug dependent adolescents. *Attachment & Human Development*, 7(3), 207- 228. <https://doi.org/10.1080/14616730500173918>

Schwartz, A., Arsandaux, J., Montagni, I., Meschke, L. L., Galera, C., & Tzourio, C. (2023). Adverse childhood experiences and substance use among university students : A systematic review. *Journal of Substance Use*, 28(6), 823- 833. <https://doi.org/10.1080/14659891.2022.2114389>

Seiffge-Krenke, I. (2006). Coping With Relationship Stressors : The Impact of Different Working Models of Attachment and Links to Adaptation. *Journal of Youth and Adolescence*, 35(1), 24- 38. <https://doi.org/10.1007/s10964-005-9015-4>

Shaver, P., & Hazan, C. (1987). *Being Lonely, Falling in Love*. 2(2), 105- 124.

Shepherd, C. B., Berry, K. A., Ye, X., & Li, K. (2021). Food and alcohol disturbance among US college students : A mixed methods scoping review. *Journal of American College Health: J of ACH*, 1- 17. <https://doi.org/10.1080/07448481.2021.1947300>

- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies : New procedures and recommendations. *Psychological Methods*, 7(4), 422- 445. <https://doi.org/10.1037/1082-989X.7.4.422>
- Slade, A., & Holmes, J. (2019). Attachment and psychotherapy. *Current Opinion in Psychology*, 25, 152- 156. <https://doi.org/10.1016/j.copsyc.2018.06.008>
- Solmi, M., Radua, J., Olivola, M., Croce, E., Soardo, L., Salazar de Pablo, G., Il Shin, J., Kirkbride, J. B., Jones, P., Kim, J. H., Kim, J. Y., Carvalho, A. F., Seeman, M. V., Correll, C. U., & Fusar-Poli, P. (2022). Age at onset of mental disorders worldwide : Large-scale meta-analysis of 192 epidemiological studies. *Molecular Psychiatry*, 27(1), Article 1. <https://doi.org/10.1038/s41380-021-01161-7>
- Suldo, S. M., & Sandberg, D. A. (2000). Relationship Between Attachment Styles and Eating Disorder Symptomatology Among College Women. *Journal of College Student Psychotherapy*, 15(1), 59- 73. https://doi.org/10.1300/J035v15n01_07
- Tasca, G. A., & Balfour, L. (2014). Attachment and eating disorders : A review of current research. *The International Journal of Eating Disorders*, 47(7), 710- 717. <https://doi.org/10.1002/eat.22302>
- Tasca, G. A., Ritchie, K., Zachariades, F., Proulx, G., Trinneer, A., Balfour, L., Demidenko, N., Hayden, G., Wong, A., & Bissada, H. (2013). Attachment insecurity mediates the relationship between childhood trauma and eating disorder psychopathology in a clinical sample : A structural equation model. *Child Abuse & Neglect*, 37(11), 926- 933. <https://doi.org/10.1016/j.chiabu.2013.03.004>
- Taylor, P., Rietzschel, J., Danquah, A., & Berry, K. (2015). Changes in attachment representations during psychological therapy. *Psychotherapy Research*, 25(2), 222- 238. <https://doi.org/10.1080/10503307.2014.886791>

- Tibbe, T. D., & Montoya, A. K. (2022). Correcting the Bias Correction for the Bootstrap Confidence Interval in Mediation Analysis. *Frontiers in Psychology, 13*.
<https://doi.org/10.3389/fpsyg.2022.810258>
- Tonmyr, L., Thornton, T., Draca, J., & Wekerle, C. (2010). A Review of Childhood Maltreatment and Adolescent Substance Use Relationship. *Current Psychiatry Reviews, 6*(3), 223- 234. <https://doi.org/10.2174/157340010791792581>
- Treasure, J., Hübel, C., & Himmerich, H. (2022). The evolving epidemiology and differential etiopathogenesis of eating disorders : Implications for prevention and treatment. *World Psychiatry, 21*(1), 147- 148. <https://doi.org/10.1002/wps.20935>
- Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika, 38*(1), 1- 10. <https://doi.org/10.1007/BF02291170>
- Ward, A., Ramsay, R., & Treasure, J. (2000). Attachment research in eating disorders. *The British Journal of Medical Psychology, 73* (Pt 1), 35- 51.
<https://doi.org/10.1348/000711200160282>
- Wedekind, D., Bandelow, B., Heitmann, S., Havemann-Reinecke, U., Engel, K. R., & Huether, G. (2013). Attachment style, anxiety coping, and personality-styles in withdrawn alcohol addicted inpatients. *Substance Abuse Treatment, Prevention, and Policy, 8*(1), 1. <https://doi.org/10.1186/1747-597X-8-1>
- Zakhour, M., Haddad, C., Salameh, P., Akel, M., Fares, K., Sacre, H., Hallit, S., & Obeid, S. (2020). Impact of the interaction between alexithymia and the adult attachment styles in participants with alcohol use disorder. *Alcohol (Fayetteville, N.Y.), 83*, 1- 8.
<https://doi.org/10.1016/j.alcohol.2019.08.007>

10. Tables

Table 1: Descriptive statistics and inter-correlations among variables included in the Structural Equation Modeling analysis

		Mean \pm SD	1	2	3	4	5	6	7	8	9
Food and Alcohol Disturbance	1. CEBRACS « alcohol »	9.21 \pm 4.59	-								
	2. CEBRACS « dietary »	8.92 \pm 4.02	0.29***	-							
	3. CEBRACS « purge »	5.05 \pm 0.41	0.15**	0.24***	-						
	4. CEBRACS « extreme fasting »	2.18 \pm 0.80	0.32***	0.40***	0.37***	-					
Attachment (RSQ scale)	5. Fearful attachment	3.21 \pm 0.67	0.11*	0.07	0.06	-0.01	-				
	6. Preoccupied attachment	2.99 \pm 0.92	0.11*	0.07	0.11*	0.12*	0.28*	-			
Child maltreatment (CTQ scale)	7. Physical abuse	5.52 \pm 1.88	0.05	0.00	0.05	0.04	0.14**	0.03	-		
	8. Emotional abuse	7.19 \pm 3.32	0.01	0.12*	0.10*	0.11*	0.20***	0.12*	0.38***	-	
	9. Sexual abuse	5.84 \pm 2.20	-0.01	0.04	0.16***	0.03	0.15**	0.09	0.23***	0.25***	-

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$ (two-tailed)

The data are presented as Spearman's rho coefficients (correlation coefficients for non-normally distributed data)

11. Figures

Figure 1: Structural model and path coefficients depicting the relationships between attachment, childhood maltreatment, and FAD

FAD: Food and Alcohol Disturbance, assessed with the CEBRACS subscales

CEBRACSextreme: “extreme fasting and vomiting” subscale; CEBRACSdtryrstr: dietary restraint and exercising” subscale; CEBRACSOH: “alcohol enhancement” subscale

Attchmt: attachment assessed with the RSQ

Chldhd_mltrtmnt: childhood maltreatment assessed with the CTQ

Data are presented as β coefficients.

* significant at $p \leq 0.05$; ** significant at $p \leq 0.01$; *** significant at $p \leq 0.001$