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**Disordered eating and alcohol consumption among adolescents:  
the role of motivations and emotion regulation**

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# **CHAPTER I**

Introduction and general aims

## **Adolescence and risk behaviors**

The task of defining “adolescence” has been much debated among scholars due to its tendency to differ considerably across cultures, over time, and within individuals (Degner, 2006); however, this term is commonly used to define the transitional period of life from childhood to adulthood, which is characterized by physical, cognitive, emotional and social changes (Kaplan, 2004; Sales & Irwin, 2013). Thus, adolescence is a period of preparation for adulthood during which time several key developmental experiences occur. To successfully face this developmental transition, adolescents are required to deal with this often stressful period while acquiring skills necessary for independence (Spear, 2000). The achievement of independence has been identified as a constant and specific developmental task during adolescence; in particular, adolescents have to manage several developmental tasks, including becoming more self-sufficient from parents and other adults, developing a clear sense of self-identity, learning how to establish more mature relationships with peers of both sexes, achieving an increased awareness of morals and values and acquiring a cognitive and emotional maturation (Havighurst, 1952, 1953).

Adolescence is also considered a stage in which individuals are faced with agitation and challenges, mainly due to a great expression of risk-taking and the tendency to experience new behaviors typical of this period of life. Although recognized as a normative part of developmental processes that allow adolescents to test their own skills and contribute to the formation of their identity and autonomy, risk-taking behaviors can often endanger individuals' health (Leon, Carmona, & Garcia, 2010; Sales & Irwin, 2009). The term “risk behavior” refers to any behavior that can have harmful consequences for health and can compromise the achievement of normal developmental tasks, as well as the accomplishment of essential skills, a sense of competence and adequacy, and the preparation for a successful transition to adulthood (Jessor, 1991; Sales & Irwin, 2013). Thus, adolescent risk-taking is a source of concern due to both immediate and long-term negative consequences that it involves; indeed, some of these behaviors, such as drinking alcohol and

disordered eating, can put adolescents' health at risk and are associated to an increase in morbidity and mortality (Leon et al., 2010; Sales & Irwin, 2013).

However, despite the negative consequences directly associated with risk behaviors, adolescents tend to think of being relatively invulnerable and assume that only others are exposed to the unfavourable outcomes of risk-taking; this understimation may lead them to an error of judgement labeled "unrealistic optimism" (Weinstein, 1980). It has been noted that an optimistic bias often occurs when individuals tend to estimate their future vulnerability by extrapolating from their past experience. Thus, those who are more likely to evoke unrealistic optimism, are those associated with the often incorrect belief that if a problem has not yet occurred, it is unlikely that it will appear in the future (Weinstein, 1987). It has been found that compared to adults, adolescents minimized the perceived risk of involvement in health-risk behaviors because their judgments are characterized by an optimistic bias (Cohn, Macfarlane, Yanez, & Imai, 1995).

Therefore, due to the several and harmful consequences related to risk-taking behaviors, identifying and understanding the factors associated with the engagement in the most prevalent risk behaviors during adolescence, is an issue of primary importance. In particular, the present dissertation was focused on investigating three common health-risk behaviors among adolescents, which refer both to alcohol use and disordered eating, such as bingeing behaviors (binge drinking and binge eating) and drunkorexia.

### **Binging behaviors**

A "binge" could be define as "a period of unrestrained, immoderate, excessive, or uncontrolled self-indulgence" (Wechsler & Nelson, 2001, p. 287) and is commonly used to describe consumption of either food ("binge eating") or alcohol ("binge drinking"); it is precisely because of their being so uncontrollable and repetitive, that bingeing behaviors are often considered as "addictive" (Ferriter & Ray, 2011; Laghi, Liga, Baumgartner, & Baiocco, 2012a).

Binge drinking and binge eating are two of the most serious health issues among young people and are associated with several physical, psychological, academic and social problems, including obesity, diabetes, depressive and anxious symptoms, poor academic performance and risky sexual behavior (Courtney & Polich, 2009; Miller, Naimi, Brewer, & Jones, 2007; Stice, Presnell, & Spangler, 2002; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994).

Estimates suggest that binge eating is prevalent among college-aged women and it has been reported that 16–25% of college women engage in bingeing episodes, in particular 9–15% of college women binge eat once a week or more; while for men, 5% binge eat at least weekly (Lynch, Evernham, Dubitzky, Hartman, & Kasser, 2000; Schlundt & Johnson, 1990; Wolff & Wittrock, 1998). In addition, a relevant prevalence was found among adolescents; indeed, it has been noted that 9,9 % of girls and 3% of boys engaged in binge eating (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011). Furthermore, several studies showed that adolescents with binge eating are at high risk for an increase in symptoms or the development of an eating disorder in later adolescence or young adulthood (e.g. Allen, Byrne, Oddy, & Crosby, 2013; Neumark-Sztainer et al., 2011).

Similarly, binge drinking is prevalent among adolescents as well; Miller, Naimi, Brewer and Jones (2007) found that 28,8% of high school students reported to binge drink with similar rates among boys and girls which tended to increase with age and school grade. Also in the Italian context binge drinking is quite widespread; it has been noted (Beccaria & Prina, 2010; Kuntsche, Rehm, & Gmel, 2004) that young Italians use to drink less alcohol than adolescents in Northern European countries, but more compared with their Southern and Eastern European counterparts. In addition, during the last decades, a significant process of change in alcohol consumption patterns of younger people is occurring: there is an increasingly evident transition from the traditional Mediterranean model, characterized by a moderate daily alcohol consumption with meals, especially of wine, to a growing episodic and excessive alcohol consumption outside meals which is more typical of Northern European countries (Allamani, Beccaria, & Voller, 2010; Beccaria & Prina, 2010). The European School Survey Projection on Alcohol and Other Drugs research (ESPAD, 2015) highlighted that 35%

of Italian adolescents reported to binge drink in the past month (37% of boys and 33% of girls). It is worth noting that the prevalence of bingeing behaviors can be strengthened by the frequent co-occurrence of these behaviors among adolescents (e.g., Gadalla & Piran, 2007; Loxton & Dawe, 2001; Measelle, Stice, & Hogansen, 2006; Von Ranson, Iacono, & McGue, 2002).

### **Binge drinking: definition and description**

Alcohol consumption contributes to the three leading preventable causes of death (unintentional injury, homicide, and suicide) among individuals aged 12 to 20 years (McGinnis & Foege, 1993; Miller et al., 2007). Most unfavourable outcomes from drinking alcohol among young people arise from acute intoxication resulting from binge drinking.

Binge drinking is the most common pattern of alcohol consumption among high school youth who drink alcohol and its key characteristic is the large and excessive quantity of alcohol consumed in a row in a short time frame (Courtney & Polich, 2009; Lange & Voas, 2001).

Despite the high prevalence and the negative consequences related to binge drinking, defining this risk behavior is a matter of ongoing debate among scholars (Ham & Hope, 2003; Segrist & Pettibone, 2009); different definitions have been used, which refer both to the amount of alcohol consumed and to the frequency with which certain individuals engage in this type of drinking behavior. For instance, an attempt to quantify binge drinking was proposed by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), which has defined “binge” as “a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0,08 grams percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours” (NIAAA, 2004, p.3); this definition has provided a structure for binge drinking, although has not taken into account variability due to factors such as age, body mass, and recent drug and food consumption and thus, making difficult a comparison among studies (Jackson, 2008). Similarly, alternatives to the term “binge drinking” are also been suggested, such as “heavy episodic drinking”, “high-risk drinking”, “harmful drinking” and “problem drinking” (Carey, 2001), even

though they do not imply a specific reference to the volume consumed, which in turn, is the reason this behavior is dangerous (Wechsler & Nelson, 2001). Furthermore, differences in designation for binge drinking involve the issue related to the use of a valid definition that can serve as an indicator to identify individuals at risk of alcohol-related problems (Esser, Kanny, Brewer, & Naimi, 2012; Fillmore & Jude, 2011; Lange & Voas, 2001; Wechsler & Nelson, 2001) and that can also catch specific gender differences (Wechsler, Dowdall, Davenport, & Rimm, 1995).

It has become a common practice in research on the topic, to repeatedly define binge drinking as the consumption of 5 or more consecutive drinks for men and 4 or more consecutive drinks for women on a single occasion within the past two weeks (e.g., Agius, Taft, Hemphill, Toumbourou, & McMorris, 2013; McBride, Barrett, Moore, & Schonfeld, 2014; Thush & Wiers, 2007; Viner & Taylor, 2007; Weitzman, Nelson, & Wechsler, 2003; Wechsler & Nelson, 2001; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). The 4/5 definition provided by Wechsler et al. (1994), has showed its ability to identify high-risk individuals in different age groups and across gender (Carey, 2001); indeed, several studies showed that it is a strong predictor of serious alcohol-related consequences including injuries, driving while intoxicated, fights, vandalism, and trouble with police (e.g., Jackson, 2008; Wechsler, Lee, Huo, & Lee, 2000; Wechsler et al., 1994). In addition, this gender-specific definition takes into account sex differences in alcohol metabolism or in body mass; it has been found that women who consumed 4 consecutive drinks on one single occasion reported similar alcohol-related problems as men who consumed 5 or more consecutive alcohol beverages (Jackson, 2008; Wechsler et al., 1995).

Binge drinking often begins around age 13 and tends to increase during adolescence and reaches its maximum rates in young adulthood; in particular, boys are found to start drinking at an earlier age compared to girls (Buu, Dabrowska, Mygrants, Puttler, Jester, & Zucker, 2014). Early onset of binge drinking has been associated with an increased risk of bingeing in adulthood and exhibiting later alcohol problems (Wechsler, Dowdall, Davenport, & Castillo, 1995; Weitzman et al., 2003). Moreover, the risk of showing injuries related to binge drinking, seems to increase with the

intensity of binge drinking such as, for instance, the number of drinks consumed (Wechsler & Nelson, 2006).

Positive alcohol expectancies, or the belief that drinking will lead to positive experiences (e.g., increasing in sociability or reducing social anxiety) seem to be significant predictors of binge drinking (Biolcati, Passini, & Mancini, 2016; McBride et al., 2014; Oei & Morawska, 2004). Drunkenness has been reported as an important factor on the basis of binge drinking (Wechsler et al., 1994), even though young individuals tend to underestimate their perceived level of inebriation (Turrise & Wiersma, 1999) and to mistakenly believe that, for instance, every additional alcohol beverage they consumed, has a decreasing impact on BAC (Jaccard & Turrise, 1987).

Drinking in a social setting, compared to drinking alone, facilitates more alcohol consumption; thus, young people who report to have many friends, to live with a roommate, to stress the importance of parties and to be sensitive to peer pressure to drink, were more likely to engage in binge drinking (Laghi, Liga, Baumgartner, & Baiocco, 2012b; Storm & Cutler, 1981; Weitzman et al., 2003). An easy access to alcohol or paying a very low sum of money for it, can be risk factors for increased alcohol consumption as well (Weitzman et al., 2003).

In addition, binge drinking is frequently associated with other health risk behaviors, such as smoking cigarettes or cigars, using illicit drugs, being a victim of dating violence, attempting suicide and indulging in unprotected sexual intercourse (Agius et al., 2013; Miller et al., 2007).

### **Binge eating: definition and description**

Binge eating is defined as the consumption of larger amount of food than usual during a limited period of time (e.g. within 2 hour) accompanied by experiencing a feeling of marked distress and loss of control over eating in absence of compensatory behaviors (such as fasting, purging or excessive exercise) to control body shape and weight. Binge eating is also characterized by the presence of at least one of the following aspects: eating large amounts of food when not feeling physically hungry, eating alone because of feeling embarrassed by how much one is eating, eating

until feeling uncomfortably full, eating much more rapidly than normal and feeling disgusted with oneself, depressed, or very guilty afterwards (American Psychiatric Association, 2013).

Binge eating is commonly described and treated as “compulsive overeating” or a “food addiction” (Cassin & von Ranson, 2007; Haddock & Dill, 1999; Wilson, 1991) and therefore, the complete abstinence from certain kinds of “addictive” and “toxic” foods is promoted and supported (Ronel & Libman, 2003). During a binge episode especially high calorie foods are consumed which are normally perceived as “forbidden” (Knight & Boland, 1989; Tanofsky-Kraff, McDuffie, Yanovski, Kozlosky, Sclevy, Shomaker, et al. 2007); in particular, several studies found increased amounts of carbohydrates, snacks and desserts (e.g., Alvarenga, Negrão, & Philippi, 2003; Bartholome, Raymond, Lee, Peterson, & Warren, 2006; Guss, Kissileff, Devlin, Zimmerli, & Walsh, 2002; Tanofsky-Kraff et al., 2007; Yanovski, Leet, Yanovski, Flood, Gold, Kissileff et al., 1992).

Binge eaters typically report to eat at home and alone and to experience secrecy about eating (Abraham & Beumont, 1982; Greeno, Wing, & Shiffman, 2000; Stein, Kenardy, Wiseman, Douchis, Arnow, & Wilfley, 2007; Tanofsky-Kraff et al., 2007). Binges usually occur in the afternoon or evening (Hsu, 1990; Grilo, Shiffman, & Carter-Campbell, 1994); however it has been reported that bingeing episodes could also occur in the morning (Waters, Hill, & Waller, 2001a). Furthermore, binges can be influenced by sensory cues strictly related to food, as seeing an attractive food or smelling a delicious flavor (Schmidt, 2000; Waters, Hill, & Waller, 2001b), as well as preparing food, starting to eat, having unstructured time or participating at social gatherings (Abraham & Beumont, 1982; Grilo et al., 1994; Johnson & Larson, 1982; Schlundt, Johnson, & Jarrell, 1985).

Negative affect has been identified as the most commonly reported antecedent to bingeing episodes (Eingelberg, Steiger, Gauvin, & Wonderlich, 2007; Hilbert & Tuschen-Caffier, 2007; Kjelsas, Borsting, & Gudde, 2004; Lingswiler, Crowther, & Stephens, 1989a; Markey & Vander Wal, 2007; Munsch, Meyer, Quartier, & Wilhelm, 2012; Polivy & Herman, 1993; Smyth, Wonderlich, Heron, Sliwinski, Crosby, Mitchell et al., 2007; Stickney, Miltenberger, & Wolff, 1999; Tanofsky-Kraff et al., 2007; Waters et al., 2001a); most of the emotional states refer to loneliness (Corstorphine,

Waller, Ohanian, & Baker, 2006; Davis & Jamieson, 2005), boredom (Kjelsas, Borsting, & Gudde, 2004; Davis & Jamieson, 2005), feelings of anxiety and depression or dysphoria (Arnou, Kenardy, & Agras, 1992; Greeno et al., 2000; Lynch, Everingham, Dubitzky, Hartman, & Kasser, 2000; Vandereycken, Pieters, & Noorduin, 2004; Vanderlinden, Dalle Grave, Vandereycken, & Noorduin, 2004), irritability, anger, frustration and regret (Arnou et al., 1992; Corstorphine et al., 2006; Davis & Jamieson, 2005; Stein, Kenardy, Wiseman, Douchis, Arnou, & Wilfley, 2007; Tachi, Murakami, Murotsu, & Washizuka, 2001).

Other possible triggers for binge eating are referred to physiological states, such as hunger and the urgency to eat sweets (Arnou et al., 1992; Schmidt, 2000; Vanderlinden, Dalle Grave, Vandereycken, & Noorduin, 2001), cognitive triggers, such as negative thoughts about oneself (Fairburn & Cooper, 1989; Vanderlinden, Dalle Grave, Fernandez, Vandereycken, Pieters, & Noorduin, 2004), food cravings (Mitchell, Hatsukami, & Eckert, 1985; Waters et al., 2001b), distorted cognitions regarding the perceived pressure to be thin and body dissatisfaction (Lai, Mak, Pang, Fong, Ho, & Guldán 2013; Stice et al., 2002; van den Berg, Thompson, Obremski-Brandon, & Covert, 2002), dieting and dietary restraint (Polivy & Herman, 1985; Stice, 2001; Woods, Racine, & Klump, 2010).

During the episodes different emotional states are experienced, such as general negative affect (Hetherington, Spalter, Bernat, Nelson, & Gold, 1993; Powell & Thelen, 1996), feelings of anxiety, shame, self-disgust, guilt, helplessness (Davis & Jamieson, 2005), a feeling of lack of self-control (Arnou et al., 1992; Lynch, Everingham, Dubitzky, Hartman, & Kasser, 2000) and a sense of “numbing” while eating (Tanofsky-Kraff et al., 2007); however binge eaters seem also to experience pleasure in eating and reported to enjoy food's taste, smell and texture (Arnou et al., 1992; Mitchell, Mussell, Peterson, Crow, Wonderlich, Crosby et al., 1999; Schmidt, 2000; Waters et al., 2001b).

Binges are commonly followed by a short period of decrease in the level of negative emotions that are been experienced; indeed, binge eating could offer an escape from negative self-evaluations and could reduce anxiety (Heatherton & Baumeister, 1991). However, this emotional state is

temporary and an increased in negative affect is quickly replaced (Lingswiler, Crowther, & Stephens, 1989b; McManus & Waller, 1995; Smyth et al., 2007); thus, after a binge-eating episode, self-critical feelings such as guilt, shame and disgust, as well as boredom, frustration, anger and anxiety could be experienced and therefore, negatively reinforce the bingeing behavior (Arnow et al., 1992; Corstorphine et al., 2006; Polivy & Herman, 1993; Neumark-Sztainer & Story, 1998; Steiger, Gauvin, Engelberg, Ying Kin, Israel, Wonderlich et al., 2005; Stein et al., 2007; Tachi et al., 2001).

### **Binge drinking and binge eating: common features**

Binging behaviors share several overlapping features, such as behavioral characteristics, personality correlates, affective features and negative consequences (e.g., Ferriter & Ray, 2011; Holderness, Brooks-Gunn, & Warren, 1994). They are both characterized by concern with the substance (alcohol or food), lack of control on the behavior, excessive consumption of the substance and immediate gratification followed by long-term harm (Benjamin & Wulfert, 2005; Ferriter & Ray, 2011). Furthermore, binge drinking and binge eating may serve the same purpose, that is to reduce or avoid negative emotional states such as anxiety, anger and loneliness; recent studies have shown that both behaviors are associated with difficulties in emotion regulation and in dealing with situations involving negative emotions (Czaja, Rief, & Hilbert, 2009; Lavender & Anderson, 2010; Whiteside, Chen, Neighbors, Hunter, & Larimer, 2007).

Studies on dispositional characteristics have identified impulsivity trait as consistently associated with these two addictive behaviors (Benjamin & Wulfert, 2005; Carlson, Johnson, & Jacobs, 2010; Dawe & Loxton, 2004; Kane, Loxton, Staiger, & Dawe, 2004; Vitousek & Manke, 1994); impulsivity has been conceptualized as characterized by four different indicators: urgency, lack of premeditation, lack of perseverance and sensation seeking (Whiteside & Lynam, 2001). It has been noted that bingeing behaviors are related both to urgency or the tendency to act rashly in response to intense negative emotions (Fisher, Anderson, & Smith, 2004, Fisher, Smith, & Cyders, 2008) and sensation seeking (D'Alessio, Baiocco, & Laghi, 2006; Greene, Krcmar, Walters, Robin, & Hale,

2000; Laghi, Pompili, Baumgartner, & Baiocco, 2015) that can be defined as “a need for varied, novel and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience” (Zuckerman, 1979, p.10). In addition, another personality trait associated with binge drinking and binge eating is neuroticism or the tendency to experience negative emotions (Cassin & Von Ranson, 2005; Chassin et al., 2002; Christiansen & Jarchow, 2002; Connolly, Rieger, & Caterson, 2007; Godart et al., 2007; Kuntsche, von Fischer, & Gmel, 2008; Lynch, Everingham, Dubitzky, Hartman, & Kasser, 2000; Stice et al., 2002; Stickney, Miltenberger, & Wolff, 1999; Vanderlinden, Dalle Grave, Vandereycken, & Noorduin, 2001; Wegner, Smyth, Crosby, Wittrock, Wonderlich, & Mitchell, 2002). In particular, it has been found that individuals who both experience high levels of negative emotions and have the tendency to act impulsively are at higher risk to show eating and alcohol use problems (Ferriter & Ray, 2011; Fischer, Smith, Annus, & Hendricks, 2007; Rush, Becker, & Curry, 2009).

With regard to environmental factors, both binge eaters and binge drinkers are found to be exposed to social pressure or influence and are characterized by the tendency to conform to the norms of the peer group (Borsari & Carey, 2001; Crandall, 1998; Laghi et al., 2012b; Lai et al., 2013; Parra, Krull, Sher, & Jackson, 2007; Reifman, Watson, & McCourt, 2006; Weitzman et al., 2003). Another common factor is related to time perspective which has been defined as “the manner in which individuals, and cultures, partition the flow of human experience into the distinct temporal categories of past, present and future” (Zimbardo & Boyd, 1997, p.1008); it has been noted the both bingers had an inclination to show a low future orientation, to report negative experiences in the past and to show an high inclination to fatalism (Laghi et al., 2012a). Thus, both binge eaters and binge drinkers seem to share the tendency to have a negative and pessimistic view of the past that recalls the negative experiences they had and a clear believe that their lives are externally controlled and they cannot modify or influence them.

Furthermore, both behaviors resulted to be associated with difficulties in decision making (Goudriaan, Grekin, & Sher, 2007; Svaldi, Brand, & Tuschen-Caffier, 2010) and with a

diffuse/avoidant identity style which is characterized by the tendency to avoid debate on goals and personal problems, conflicts of identity that are typical in adolescence (Laghi, Baiocco, Liga, Lonigro, & Baumgartner, 2014; Laghi et al., 2012b; Wheeler, Adams, & Keating, 2001). Among protective factors, an important role in both binge eating and binge drinking, is played by self-esteem (Glindemann, Geller, & Fortney, 1999; Laghi et al., 2012a; Luhtanen & Crocker, 2005; Stice et al., 2002), as well as by perceived social support (in particular, to be able to rely on tangible and material help, and to have someone to be able to talk or relax with) (Peirce, Frone, Russell, & Cooper, 1996; Stice et al., 2002) and satisfaction with life (Laghi et al., 2012a; Murphy, McDevitt-Murphy, & Barnett, 2005; Zullig, Valois, Huebner, Oeltmann, & Drane, 2001). Finally, both individuals who binge eat and binge drink show significant negative consequences; the ones associated with binge eating include poor school performance and physical problems mainly related to overweight (Sonneville Calzo, Horton, Haines, Austin, & Field, 2012; Striegel-Moore & Franko, 2008; Yanover & Thompson, 2008). Likewise, adverse consequences often experienced by binge drinkers are poor academic performance, risky sexual behaviors and physical injuries due, for instance, to fights or driving after drinking (Agius et al., 2013; Courtney & Polich, 2009; Jackson, 2008; Miller et al., 2007).

### **Motivations for binge drinking and binge eating**

Due to the high prevalence and the significant unfavourable consequences associated with binge drinking and binge eating, there is an existing body of research aimed to understand the motivations underneath bingeing behaviors, theorizing explanatory models which may be useful to clarify the link between these two addictive behaviors. Studies focused on examining why individuals engage in eating and drinking behaviors, are mainly addressed to antecedents of binge eating and drinking, suggesting that certain needs or desires could trigger the engagement in bingeing behaviors (Ferriter & Ray, 2011).

Cooper and colleagues (Cooper, 1994; Cooper, Frone, Russell, & Mudar, 1995) developed an alcohol motivational model which account for four different motives explaining why individuals engage in alcohol use. In line with Cox and Klinger (1988, 1990), they theorized that motivations for alcohol consumption are characterized along two underlying dimensions which reflect both the valence (positive or negative) and the source (internal or external) of outcomes individuals would like to achieve by drinking alcohol. Four different types of drinking motives arise by crossing these two dimensions: social, coping, enhancement and conformism. Social motives (positively valenced, externally elicited) consist of drinking to improve and facilitate social relationships; coping motives (negatively valenced, internally elicited) occur when drinking aims to reduce negative emotions such as loneliness, boredom, sadness; enhancement motives (positively valenced, internally elicited) are indeed characterized by drinking to increase pleasure or positive affect; finally, conformism motives (negatively valenced, externally elicited) occur when the consumption of alcohol is used to comply with social expectations and be accepted by others.

Of the drinking motives, enhancement motives have demonstrated the strongest association with binge drinking (see Kuntsche, Knibbe, Gmel, & Engels, 2005 for a review). Thus, young people tend to binge drink mainly to enhance pleasant emotions, such as for enjoyment, to seek excitement, to have fun, to get a party more enjoyable and to get high and drunk (Carrus, Panno, Deiana, Crano, Fiorentino, Ceccanti et al., 2016; Engels, Wiers, Lemmers, & Overbeek, 2005; Gonzalez, Collins, & Bradizza, 2009; Kuntsche & Cooper, 2010; Kuntsche & Labhart, 2013; Lyvers, Hasking, Hani, Rhodes, & Trew, 2010; Németh, Urbán, Kuntsche, San Pedro, Nieto, Farkas et al., 2011; Van Damme, Maes, Clays, Rosiers, Van Hal, & Hublet, 2013); feeling the effects of alcohol appeared to be highly endorsed for binge drinkers (Kairouz, Gliksmann, Demers, & Adlaf, 2002; Kuntsche et al., 2005). In particular, among the few studies on adolescents, Kuntsche, Knibbe, Gmel and Engels (2006) found that certain adolescents who are motivated to drink to have fun and to get drunk had a preference for particular beverages such as beer and spirits which seem better suited to achieve their desired outcomes. Coping motives have been also repeatedly related to binge drinking, which can be

used as a strategy in order to avoid or reduce negative emotions (Christiansen, Vik & Jarchow, 2002; Cooper, Agocha, & Sheldon, 2000; Graziano, Bina, Giannotta, & Ciairano, 2012; Kuntsche et al., 2006; Laghi, Baumgartner, Baiocco, Kotzalidis, Piacentino, Girardi et al., 2016; Lyvers et al., 2010; Siviroj, Peltzer, Pengpid, Yungyen, & Chaichana, 2012; Van Damme et al., 2013) In addition, studies focused on examining the associations of drinking motives with binge drinking in various contexts, showed that drinking to cope with negative affect was positively associated with solitary binge drinking, whereas enhancement motives for drinking were related to social binge drinking contexts (Cooper, Russell, Skinner, & Windle, 1992; Gonzales et al., 2009). It appears that young people may be mostly motivated to binge drink to regulate both positive and negative emotions. It has been also found a relationship between binge drinking and social motives; therefore engaging in binge drinking may be motivated by the desire to be sociable, to improve social gatherings (e.g., making social gatherings more fun) and facilitate social interactions (Carrus et al., 2016; Engels et al, 2005; Kairouz et al., 2002; Lyvers et al., 2010; Van Damme et al., 2013).

More recently, Jackson, Cooper, Mintz, and Albino (2003) proposed a model that distinguishes four different motives that can be involved in eating behaviors: coping, social, pleasure and compliance. Coping-motivated eating consists of eating to reduce or avoid negative emotional states such as anxiety, frustration or loneliness; social motives occur when food is consumed during social occasions such as parties or other group activities; pleasure motives consist of eating for the sensory pleasure of food such as the smell of a delicious aroma or the sight of an attractive food; compliance motives are instead characterized by eating to comply with other's expectations.

Although to date motivations have not been assessed in the same way for binge eating and binge drinking, research suggests that the motivations underlying both binging behaviors may be similar. As previously discussed, binge eating is commonly preceded by negative affect and followed by immediate and temporarily reinforcing mechanisms that enhance the mood (e.g. Markey & Vander Wal, 2007; Munsch et al., 2012; Polivy & Herman, 1993); thus, compared to other motivations, a stronger association was found between binge eating and emotional eating (e.g., coping motives)

(Boggiano, Burgess, Turan, Soleymani, Daniel, Vinson et al., 2014; Haedt-Matt & Keel, 2001; Laghi et al., 2015; Ricca, Castellini, Lo Sauro, Ravaldi, Lapi, Mannucci et al., 2009; Ricca, Castellini, Fioravanti, Lo Sauro, Rotella, Ravaldi et al., 2012; Stice et al., 2002; Waller & Osman, 1998; Waters et al., 2001b). It seems that binge eating may function as a way to forget worries and problems, and provide comfort and distraction from negative affect. It appears that both binge eaters and drinkers could be motivated by the desire to avoid or just reduce negative affective states they perceive; in particular, it has been suggested that both behaviors could be motivated by the need to escape from negative self-evaluations and to reduce anxiety (Heatherton & Baumeister, 1991). Both alcohol and binge eating, may be able to reduce negative affect by their reinforcing property of narrowing cognitive attention from higher-level abstract thinking (in particular with respect to failures in reaching high standards) to the more immediate environment. Infact, binge eaters are characterized by high standards and internalized expectations and show sensitivity to the perceived demands that come from others; when they feel to fail in reaching these standards and expectations, binge eating seem to offer an escape from these evaluations and anxious symptoms. Alcohol may also be used to escape these negative evaluations, as several studies showed that alcohol can be able to narrow cognitive attention and reduce anxious symptoms (e.g., Bartholow, Pearson, Wieman, Fabiani, & Gratton; 2003; Bolton, Cox, Clara, & Sareen, 2006). In addition, it has been noted (Laghi et al., 2015; Schmidt, 2000; Waters et al., 2001b) that binge eating may be also promoted by environmental stimuli, such as smelling or seeing an appetizing food, watching television or a movie or advertising. Finally, an association has been found between binge eating and social motives, but only in male adolescents, who showed the tendency to consume food especially when involved in social occasions where probably individuals are more motivated to adhere to group norms (Laghi et al., 2015).

### **Co-occurrence of disordered eating and alcohol consumption: Drunkorexia**

The co-occurrence of disordered eating and alcohol use and misuse has frequently been highlighted in literature (e.g., Bulik, Klump, Thornton, Kaplan, Devlin, Fichter et al., 2004; Gadalla

& Piran, 2007; Loxton & Dawe, 2001; Kelly-Weeder, 2011; Luce, Engler, & Crowther, 2007; Ricciardelli, Williams, & Finemore, 2001; Von Ranson et al., 2002; Williams & Ricciardelli, 2003). For instance, it has been noted that individuals who reported frequent alcohol use and binge drinking behavior were also more likely to report a variety of adverse eating-related behaviors such as unhealthy dietary patterns including dietary restraint, infrequent breakfast consumption, poor diets, unhealthy weight control, purging, trying to lose weight, binge eating episodes and body dissatisfaction (Khaylis, Trockel, & Taylor, 2009; Krahn, Kurth, Demitrack, & Drownowski, 1992; Nelson, Lust, Story, & Ehlinger, 2009; Piran & Robinson, 2011; Ricciardelli et al., 2001; Root, Pissetsky, Thornton, Lichtenstein, Pederson, & Bulik, 2010; Stewart, Angelopoulos, Baker, & Boland, 2000).

Over the last few years, there is growing interest among scholars in a particular behavior characterized by the co-occurrence of disordered eating and drinking consumption named “Drunkorexia”, a non-medical and newly term coined by the popular media in 2008 (CBS News, 2008; Chambers, 2008). Although lacking systematic definition, the main component of this phenomenon is a self-imposed calorie restriction prior to consuming alcohol (Burke, Cremeens, Vail-Smith, & Woolsey, 2010; Giles, Champion, Sutfin, McCoy, & Wagoner, 2009). Giles et al. (2009) found that 39% of college students who took part in the research (29% of males and 45% of females) reported restricting calories on days they planned to drink alcohol; furthermore, restricting calories on drinking days was significantly related to increased likelihood to get drunk in a typical week for both males and females. A pilot study carried out in an Italian sample showed that 32.2% of the participants reported restricting caloric intake before drinking, with a significant prevalence among those who regularly consumed alcohol, compared to non-regular users (Lupi, Acciavatti, Santacrose, Cinosi, Martinotti, & Di Giannantonio, 2015).

In order to restrict calories before drinking, different dysfunction eating behaviors have been reported, including reducing the consumption of high-calorie or fatty foods, eating less during meals, skipping meals, fasting and using compensatory behaviors such as self-induced vomiting, use of

laxatives and/or diuretics and excessive exercising (Babiaz, Ward, & Brinkman, 2013; Bryant, Darkes, & Rahal, 2012; Peralta, 2002; Piazza-Gardner & Barry, 2013).

One of the main motivations underlying drunkorexia behavior is referred to compensate for calories consumed through alcoholic beverages to prevent weight gain or to produce a weight loss (Eisenberg & Fitz, 2014; Giles et al., 2009; Peralta, 2002). Restrictors impose strict rules to themselves regarding both the amount and the type of food to consume (e.g., avoiding the consumption of high-calorie foods), because of the significant number of non-essential calories that alcohol contains; thus, they seem to use mainly cognitive strategies to regulate their eating behavior, rather than internal physiological feelings of hunger and fullness (Herman & Polivy, 2004; Luce, Crowther, Leahey, & Buchholz, 2013). It has also been noted (Peralta, 2002) that, in addition to altering their eating patterns, restrictors tend to change the type of alcoholic drinks consumed, for instance, preferring light beers to spirits for fear of gaining weight. Furthermore, Eisenberg and Fitz (2014) found that females were more likely than males to engage in drunkorexia for the desire to control their weight; it was also showed that the relation between weight control motivations and drunkorexia was stronger for heavier-drinking females compared to lighter-drinking females.

Another important motive for drunkorexia refers to the desire to intensify the intoxicating effects of alcohol (e.g., alcohol consumption on empty stomach allows to reach the maximum peak of BAC in a short time) (Bryant et al., 2012; Giles et al., 2009; Peralta, 2002). In particular, Bryant et al. (2012) found that binge drinkers were more likely to report restricting food before drinking in order to feel the effects of alcohol faster and to become more drunk, compared to non-binge, suggesting that binge drinkers may have a higher tolerance for the effects of alcohol.

Furthermore, Ward and Galante (2015) examined other motivations that can drive the engagement in drunkorexia in a sample of college students, using Cooper's (1994) alcohol motivational model as framework; their results revealed that drunkorexia was associated with both enhancement and conformism motives, indicating that this behavior could be motivated by the desire to enhance positive affect (e.g., because it helps to enjoy a party) or to comply with others (e.g.,

because friends encourage to restrict calories). Indeed, both male and female students who engage in drunkorexia, reported feeling pressure from their peers to drink and to maintain or achieve a desired and socially acceptable body shape (Peralta, 2002). In particular, students who live with friends, compared to those who live alone or with others (e.g., parents), seemed more likely to engage in dysfunctional compensatory behaviors prior to alcohol consumption; probably living together can allow to talk about weight concern and encourage one another to engage in drunkorexia (Bryant et al., 2012; Peralta, 2002). In addition, drunkorexia may also occur in individuals with anorexia nervosa: in this case alcohol consumption may have the function to inhibit anxiety and depression due to the distorted view of body image, and consuming large amounts of alcohol can also induce vomiting and the resulting elimination of the ingested food (Peralta, 2002).

A number of studies showed that restricting food on days when drinking is planned, is more prevalent among females (Barry, Whiteman, Piazza-Gardner, & Jensen, 2013; Bryant et al., 2012; Giles et al., 2009; Eisenberg & Fitz, 2014). In particular, it has been noted (Barry et al., 2013) that females tend to use more restrictive eating patterns (such as eating low-calorie or low-fat food and eating less than usual during one or more meals) than males both before drinking, while drinking and after the effects of alcohol have vanished; in addition, a significant difference between males and females was showed, which refers to their preference for eating patterns used for weight loss or weight maintenance, with males preferring excessive exercising to restrict calories, whereas females tend to use alternative methods such as skipping meals or vomiting. Nevertheless, other studies did not find any significant gender differences related to drunkorexia (Burke et al., 2010; Lupi et al., 2015).

Although drunkorexia seems to represent the overlapping of disordered eating behaviors and risky alcohol consumption, it is still quite unclear whether this behavior is more strongly related to substance use or disordered eating; to our knowledge only one recent study so far, was aimed to clarify about this topic and examine whether disordered eating or alcohol use adds incremental validity to the prediction of drunkorexia both in males and females. Specifically, Hunt and Forbush (2016) revealed that both disordered eating and alcohol use were positive, significant predictors of

drunkorexia in both male and female college students; however, drunkorexia resulted to be more strongly related to disordered eating in females. In particular, among different dysfunctional eating behaviors, body dissatisfaction, cognitive restraint, purging and excessive exercise were significant predictors of drunkorexia in females; whereas in males drunkorexia was significantly related to binge eating, cognitive restraint, purging and restricting.

The increased alcohol toxicity, due to food restriction prior to consuming alcohol, can lead to serious health consequences in terms of nutritional deficiencies, alteration of metabolic processes, organ damage, brain damage and cognitive impairment (Burke et al., 2010). In addition, it has been found that females who reported eating less food prior to drinking, compared to those who reported eating more in order to avoid becoming sick or prevent a hangover, showed more eating disorders symptoms, dietary restraint, anxiety and depressive symptoms and alcohol problems (Roosen & Mills, 2015). Finally, gender differences in unfavourable consequences were found by Giles et al. (2009), who highlighted that females who engaged in drunkorexia were more likely to report memory loss, being injured and having unprotected sex while drinking, whereas males were more likely to get into a physical fight.

### **Disordered eating, alcohol consumption and emotion regulation**

It has often been underlined an important, even central, role of emotional factors in relation both to alcohol use and disordered eating. As mentioned earlier, coping motives or the desire to reduce negative emotions, seem a shared characteristic for alcohol use and disordered eating, and are strongly associated with high levels of negative affect and expectations that drinking or eating behaviors may help to improve the mood (Ferriter & Ray, 2011; Markey & Vander Wal, 2007). Thus, it is assumed that alcohol or food are substances that can be used to regulate emotions, and drinking or eating, in order to influence and alter emotional affect, may be perceived as a strategy of emotion regulation (e.g., Boggiano et al., 2014; Dragan, 2015; Veilleux, Skinner, Reese, & Shaver, 2014). Indeed, experiencing frequent or strong negative affect is not problematic in itself; individuals who

experience more intense emotions and know how to regulate them, may not show unfavourable consequences; it may be that, the lack of emotion regulation skills, can induce some individuals to learn to use substances as a coping strategy (Veilleux et al., 2014).

The term “emotion regulation” has been used to refer to a variety of abilities that allow individuals to identify, monitor, evaluate, and modify the nature and the course of an emotional response, in order to achieve one’s goals and respond to environmental demands in a fitting way (Cole, Martin, & Dennis, 2004; Gross, 2007; Nolen-Hoeksema, 2012; Thompson & Calkins, 1996). Gratz and Roemer (2004) proposed an integrative conceptualization of emotion regulation as a multidimensional construct “involving the (a) awareness and understanding of emotions, (b) acceptance of emotions, (c) ability to control impulsive behaviors and behave in accordance with desired goals when experiencing negative emotions, and (d) ability to use situationally appropriate emotion regulation strategies flexibly to modulate emotional responses as desired in order to meet individual goals and situational demands” (p. 42). Emotion regulation is considered having an essential role as integral part of normative development and adaptive functioning (Cole, Micheal, & Teti, 1994; Weiss, Sullivan, & Tull, 2015) and the relative lack of some or all these mentioned abilities would involve difficulties in emotion regulation, or emotion dysregulation which has been associated with several maladaptive and risk behaviors including alcohol use and disordered eating (e.g., Aldao, Nolen-Hoeksema, & Schweizer, 2010; Gratz & Roemer, 2004; Nolen-Hoeksema, 2012; Weiss et al., 2015).

With respect to alcohol use, some studies have been focused on examining the association between problem drinking and difficulties in emotion regulation abilities among young people. For instance, it has been found that difficulties in emotion regulation were directly related to alcohol use problems among young males (Fischer, Forthun, Pidcock, & Dowd, 2007). Even in young females, problem drinking was found to be positively associated with different dimensions of emotion dysregulation (such as non-acceptance of emotional responses, inability to engage in goal-directed behaviours, difficulties controlling impulsive behaviours when experiencing negative emotions, lack

of emotional awareness and clarity and limited access to emotion regulation strategies) but failed to directly predict problem drinking; relationship between these variables was indeed mediated by positive metacognitions about alcohol use which can be conceptualized as a specific form of expectancy relating to the use of alcohol in order to control and regulate cognition and emotion (Dragan, 2015). It has also been found (Dvorak, Sargent, Kilwein, Stevenson, Kuvaas, & Williams, 2014) that emotion regulation deficits were related to both problematic alcohol use and alcohol-related consequences among college aged students. In particular, analyzing specific dimensions of emotion dysregulation, difficulties controlling impulsivity were positively related to the number of drinks consumed during the week among active drinkers, whereas non-acceptance of emotional responses, lack of emotional clarity, difficulties engaging in goal-directed behavior and impulse control difficulties were all positively related to the number of consequences endorsed. Furthermore, likelihood of experiencing alcohol-related consequences was associated with difficulty engaging in goal-directed behavior. Finally, Veilleux et al. (2014) showed that the ability to clearly identify specific emotional experiences may be an important aspect in predicting drinking with the aim to cope with negative affect for individuals who report intense negative emotions.

Other studies were also interested in investigating the role of emotion regulation in relation to alcohol dependence (AD); for instance, Berking et al. (2011) found that participants with AD showed more difficulties in emotion regulation skills compared to non-clinical sample. Furthermore, deficits in adaptive emotion regulation abilities seemed to maintain AD, showing that individuals who were classified as consumers at post-treatment obtained low levels of emotion regulation in comparison with the abstinent ones. Indeed, it has been noted (Petit, Luminet, Maurage, Tecco, Lechantre, Ferauge et al., 2015) that abstinence is associated with more adaptive emotion regulation strategies and that difficulties in regulation abilities may lead to craving and may also maintain alcohol use. In addition, Paulus et al. (2016) highlighted that emotion dysregulation could be a possible mechanism in explaining the association between negative affect and problematic alcohol use and symptoms of dependence; in particular, in analyzing different dimensions of emotion regulation difficulties,

deficits in engaging in goal-directed behavior and limited access to affective emotion regulation were found to significantly mediate this relation for both outcomes. Conversely, non-acceptance of emotional responses was a significant mediator between negative affect and problem drinking.

Similarly, it has been found that difficulties in emotion regulation are associated with disordered eating (e.g., Czaja et al., 2009; Lavander & Anderson, 2010; Muehlenkamp, Peat, Claes, & Smits, 2012; Sim & Zeman, 2006). It has been suggested that disordered eating may be used in order to regulate emotions, mainly through the avoidance and inhibition of emotional experience; thus, disordered eating behaviors, such as bingeing, vomiting and restriction may function as a way to regulate and manage negative emotional state experienced (Harrison, Sullivan, Tchanturia, & Treasure, 2009; Nandrino, Doba, Lesne, Christophe, & Pezard, 2006). For instance, research with clinical samples has underlined that difficulties regulating emotions is a shared characteristic in patients with anorexia nervosa (Brockmeyer et al., 2011; Harrison et al., 2009, 2010), bulimia nervosa (Mauler, Hamm, Weike & Tuschen-Caffier, 2006) and binge eating disorder (Gianini, Marney, White, & Masheb, 2013). With regard to specific dimensions of emotion dysregulation, it has been noted (Gilboa-Schechtman, Avnon, Zubery, & Jeczmiem, 2006) that women with eating disorders reported greater difficulties in paying attention towards emotional states and discriminating among emotions, compared to healthy controls.

Likewise, studies with non-clinical samples have showed that disordered eating behaviors, such as bingeing and dieting, are related to emotion regulation problems. In particular, Whiteside et al. (2007) reported that binge eating in male and female college students were associated with specific types of emotion regulation difficulties such as limited access to emotion regulation strategies and difficulty identifying and making sense of emotions. Furthermore, children with bingeing episodes were found to make a high use of dysfunctional emotion regulation strategies, especially for the regulation of anxiety (Czaja et al., 2009). Also dieting in college females was associated with emotion regulation problems, including difficulties discriminating among emotional states and less confidence in the ability to regulate emotions (Ackard, Croll, & Kearney-Cooke, 2002). In addition, it has been

noted (Lafrance Robinson, Kosmerly, Lafrance, & Mansfield-Green, 2014) that males and females who reported using dieting as eating behavior, may differ in specific difficulties regulating emotions. Specifically, dieting in men was associated with difficulties controlling impulsive behaviours when experiencing negative emotions, limited access to emotion regulation strategies and non-acceptance of emotional responses; whereas, in addition to these mentioned, dieting in females was also associated with inability to engage in goal-directed behaviours and lack of emotional awareness and clarity.

### **General aims**

Based on this introduction, the current dissertation was aimed at better understanding the possible mechanisms underlying three prevalent risk behaviors among adolescents such as binge drinking, binge eating and drunkorexia. Specifically, Study 1 was focused on investigating the motivations that can drive adolescents to engage in bingeing behaviors. Although there is a growing interest in analyzing the reasons why some individuals repeatedly engage in eating and drinking behaviors, only few studies have examined the motives for binge drinking and binge eating in adolescents. Furthermore, to our knowledge, no study so far have explored together both motivations for binge eating and binge drinking; indeed, in line with the proposed theoretical framework, motivations underlying both bingeing behaviors may be similar and perform the same function. Thus, clarifying their common features may have important implications for better understanding a common etiological pathway for bingeing behaviors.

Study 2 was instead focused on drunkorexia, a recent phenomenon that, for this reason, is still understudied and little is known about the factors associated with this behavior. Furthermore, the papers that have been published on this topic were performed on samples of college students, especially on females; to our knowledge only one study was focused on adolescents.

The goal of the study was threefold; a first goal was to better clarify the relationship of drunkorexia with disordered eating and alcohol consumption; specifically, to elucidate whether drunkorexia is most strongly related to disordered eating behaviors or alcohol use and thus, whether it can be considered more as an eating disorder or a substance use disorder. As for bingeing behaviors, the second goal was to examine motivations for drunkorexia, in order to better understand why some individuals engage in this behavior with so harmful consequences. Finally, the third goal was to analyze the relation between drunkorexia and emotion regulation; specifically we aimed to explore whether drunkorexia is related to different dimensions of emotion dysregulation. To our knowledge this is the first study which was focused on investigating this relationship.

## **CHAPTER II**

Study 1. Binge eating and binge drinking among adolescents: the role of drinking and eating motives

## **Study 1**

### **Binge eating and binge drinking among adolescents: the role of drinking and eating motives**

#### **Current study**

The objective of the present study was to investigate the motivations underlying binge eating and binge drinking behaviors in a sample of adolescents. Existing literature has suggested that bingeing behaviors share several features and also the reasons why adolescents engage in these two risk behaviors may be similar. In accordance with previous findings (e.g., Boggiano et al., 2015; Jackson et al., 2003; Cooper, 1994; Cooper et al., 1995; Kuntsche et al., 2006; Ricca et al. 2009; Stice et al., 2002), which highlighted that both bingeing behaviors may be used in order to avoid or reduce negative emotional states perceived, we hypothesized that emotional motivations (or coping motivations) would be associated with both binge eating and drinking. Furthermore, consistent with existing literature (e.g., Cooper et al., 1995; Engels et al., 2005; Kuntsche et al., 2005; Van Damme et al., 2013) which showed that, binge drinkers, in addition to regulate negative emotions, may be motivated to regulate positive affect, we expected that enhancement motives would be also significantly related to binge drinking.

## **Methods**

### **Participants and Procedure**

A sample of 302 adolescents (185 males and 117 females) with a mean age of 18.03 years (SD=1.16; range 15-21) participated at the present study by completing anonymous self-report questionnaires administered during classroom time. They were enrolled in four high schools from the centre of Italy, which agreed to take part at the research. Each school was contacted by sending letters where objectives and procedures of the study were explained. The participation of the adolescents

was preceded by the attainment of both students and their parents' informed consent. Participation was voluntary and confidential.

## **Measures**

*Motivations for Eating Scale.* Motivations for Eating Scale (MFES; Hawks, Merrill, Gast, & Hawks, 2004) is composed of forty-three items on Likert type-scale ranging from 1 (never) to 5 (always). It contains the following four subscales: Emotional eating (EM), which occurs when food is consumed mainly in response to emotional states such as loneliness, boredom, depression or frustration (sample item, "The situations or conditions that most often exist when I choose to eat are when I get annoyed"); Environmental eating (EN), is defined as the consumption of food that occurs in response to environmental factors such as the smell or sight of food, cook the food or see the advertising on television (sample item is "The situations or conditions that most often exist when I choose to eat are when I am around a lot of good food"); the Physical eating (P), comes in response to physical signals of hunger as the rumbling of the stomach or other physical sensations of hunger or other recognizable signal that the body needs food (sample item, "The situations or conditions that exist when I choose to eat are when I feel physical hunger pangs"); Social eating is defined as food consumption which occurs in response to participation in social situations, such as parties or other group activities (sample item "The situations or conditions that exist when I choose to eat are when I am at a family gathering").

Psychometric analyses have shown that MFES is a reliable and a valid measure; MFES subscales correlated predictably with subscales from Emotional Eating Scale and the Three Factor Eating Questionnaire, suggesting good convergent validity and providing support for its use in community and college settings. The Italian translation of MFES has been used in previous studies revealing a good reliability in the Italian context with alpha coefficients of the subscales ranging from .76 to .91 (Laghi et al., 2015).

*Eating Disorder Inventory-3*. The Eating Disorders Inventory -3 (EDI-3; Garner, 2004) is an instrument consisting of 91 items and 12 subscales aimed to measure psychological traits or symptoms that are relevant in the development and maintenance of eating disorders. Subscales are divided into 3 eating disorder-specific scales (Drive for Thinness, Bulimia and Body Dissatisfaction) and 9 general psychological scales that are relevant but are not specific for eating disorders (Low Self-Esteem, Personal Alienation, Interpersonal Insecurity, Interpersonal Alienation, Interceptive Deficits, Emotional Dysregulation, Perfectionism, Maturity Fears and Asceticism) . Besides 12 primary scores, EDI-3 provides also six composite scores: Eating Disorder Risk Composite, Ineffectiveness Composite, Interpersonal Problems Composite, and General Psychological Maladjustment Composite.

In accordance with the purpose of the present study, Bulimia subscale of EDI-3 was used to assess Binge eating behaviors. This subscale consists of 8 items measuring both binge eating symptoms and purging. Since only one item reflects purging behavior, (i.e. “I have thought of trying to vomit in order to lose weight”), this item was deleted from the computation of the scale’s final score; so that the remaining 7 items were specifically focused on Binge eating (see also Boone, 2013; Boone, Soenens, Mouratidis, Vansteenkiste, Verstuyf & Braet, 2012; Woods, Racne & Klump, 2010).

The Italian version of EDI-3 (Giannini, Pannicchia, Dalle Grave, Muratori, & Viglione, 2008) has shown good psychometric properties. Internal reliability of the scales range from .80 and .90, and test-retest reliability coefficients for the composite scales are between .93 and .98.

*Binge drinking*. To assess binge drinking, we asked participants to answer the following questions: 1) “Considering all types of alcoholic beverages, have you ever drank 5 or more drinks (4 if you are female) on one single occasion?”; 2) “How many times in the last two weeks?”.

*Drinking Motives Questionnaire Revised Short Form* (DMQ-R SF; Kuntsche & Kuntsche, 2009). The instrument consists of 12 items which contributing to one of the four subscales indicating four distinct

drinking motives: Enhancement, Social, Conformity and Coping. Considering all the times they drink alcohol beverages (beer, wine, hard liquor, etc.), participants are asked to indicate how often they drink for the following specified reason using a frequency scale ranging from 1 = never to 3 = almost always: drinking to increase the level of positive emotions (Enhancement; sample item "...because it helps you enjoy a party"); drinking to facilitate social relationships (Social; sample item "...because it makes social gatherings more fun"); drinking for the fear of being rejected by a group (Conformity; item sample "...to fit in with a group you like"); drinking to reduce negative emotions (Coping; sample item "...because it helps you when you feel depressed or nervous").

The Italian version of the scale (Mazzardis, Vieno, Kuntsche, & Santinello, 2010) has shown good psychometric properties with internal reliability for the four subscales ranging from .64 to .79, and convergent validity with sensation seeking dimensions and frequency of alcohol use.

### **Statistical Analysis**

Data were analyzed using SPSS Statistics Version 17.0. Preliminary, we investigated gender differences by conducting one-way ANOVAs on Binge eating and Binge drinking. We carried out MANOVAs on Motivations for Eating subscales and Drinking Motives subscales. For these multivariate analyses, Wilks'  $\lambda$  criterion was used.

We performed Pearson correlations in order to examine both the association among Binge eating, Motivations for Eating subscales, and gender, and the relation among Binge drinking, gender and Drinking Motives. Before proceeding with regression analyses to assess which specific Motivation for Eating contributes to predict Binge eating, and to determinate the contributions of Drinking Motives in predicting Binge drinking, we verified that the assumptions of hierarchical regression were satisfied and checked for collinearity. All the variance inflation factor scores (VIF) ranged from 1.09 to 1.69, and correlations among the predictor variables did not exceed  $r=.61$ , thus, there was no issues with multicollinearity within the data.

For Binge eating as dependent variable, regression analysis were performed in two steps: gender was entered in step 1, followed by Motivations for Eating subscales in step 2. Only the subscales which correlated with Binge eating were entered into the regression. Another regression analysis was repeated for Binge drinking as dependent variable; in step 1 gender was entered, followed by Drinking Motives subscales which correlated to Binge drinking in step 2.

## Results

### **Preliminary analyses: gender differences**

Descriptive statistics for the variables used in the present study are shown in Tables 1 and 2. One-way ANOVA showed significant differences between males and females on Binge eating,  $F(1, 300) = 8.52$ ,  $p < .01$ , where females obtained higher scores than males. On the contrary, one-way ANOVA performed on Binge drinking did not showed any differences between males and females.

The MANOVA on Motivations for Eating subscales revealed a significant main effect for gender,  $\lambda = .92$ ,  $F(4, 297) = 6.52$ ,  $p < .001$ ,  $\eta_p^2 = .08$ . Results of the univariate tests showed that males and females only differed on the Emotional Eating subscale,  $F(1, 300) = 24.07$ ,  $p < .001$ ,  $\eta_p^2 = .07$ , where females showed a higher mean score than males.

The MANOVA on Drinking Motives subscales also showed a main effect for gender  $\lambda = .89$ ,  $F(4, 280) = 8.47$ ,  $p < .001$ ,  $\eta_p^2 = .11$ . Results of the univariate tests revealed that males and females differed both on the Social subscale,  $F(1, 283) = 11.61$ ,  $p = .001$ ,  $\eta_p^2 = .04$ , where females showed a lower mean score than males, and on the Coping subscale,  $F(1, 283) = 5.07$ ,  $p < .05$ ,  $\eta_p^2 = .02$ , where differently, females obtained a higher mean score than males.

Table 1. Means, Standard Deviations, Cronbach's alpha and Correlations among Binge eating, Motivations for Eating subscales and gender

Variable	Males		Females		Total sample		1	2	3	4	5	6
	M	SD	M	SD	M	SD						
1. Binge eating	4.18	5.22	6.11	6.17	4.93	5.67	–					
2. Environmental Eating	30.97	7.81	31.61	7.10	31.22	7.54	.40**	–				
3. Emotional Eating	37.08	13.43	45.53	16.24	40.35	15.13	.69**	.40**	–			
4. Physical Eating	23.91	5.97	24.25	6.28	24.04	6.09	.11	.45**	.11*	–		
5. Social Eating	12.60	3.98	13.16	3.72	12.82	3.89	.32**	.61**	.40**	.34**	–	
6. Gender	–	–	–	–	–	–	.17**	.04	.27**	.03	.07	–
Cronbach's alpha	–	–	–	–	–	–	.81	.79	.92	.81	.61	–

Note: Gender (0 = males, 1= females). \* p < .05, \*\*p <.01.

Table 2. Means, Standard Deviations, Cronbach's alpha and Correlations among Binge drinking, Drinking Motives subscales and gender

Variable	Males		Females		Total sample		1	2	3	4	5	6
	M	SD	M	SD	M	SD						
1. Binge drinking	.31	.66	.25	.66	.29	.66	–					
2. Enhancement	5.32	1.68	4.98	1.77	5.20	1.72	.28**	–				
3. Social	6.32	1.81	5.57	1.79	6.04	1.83	.28**	.60**	–			
4. Conformity	3.40	.98	3.27	.86	3.35	.94	.03	.00	.16**	–		
5. Coping	4.49	1.63	4.96	1.88	4.66	1.74	.21**	.36**	.47**	.17**	–	
6. Gender	–	–	–	–	–	–	-.04	-.10	-.20**	-.07	.13*	–
Cronbach's alpha	–	–	–	–	–	–	–	.71	.80	.78	.80	–

Note: Binge drinking (N= 218), Drinking motives (N= 285) Gender (0 = males, 1= females). \* p < .05, \*\*p <.01.

### **Correlations among Binge eating, Motivations for Eating subscales and gender**

In order to examine the relationship between Binge eating and Motivations for Eating subscales, Pearson correlations were performed (Table 1). Binge eating was significantly and positively associated to Environmental Eating, Emotional Eating and Social Eating. A positive and significant association was also found between Binge eating and gender.

### **Correlations between Binge drinking, Drinking Motives subscales and gender**

Pearson correlations were also performed to investigate the association between Binge drinking and the four drinking motives on the DMQ-R SF (Table 2). Results revealed that Binge drinking was positively correlated with Enhancement motives, Social motives and Coping motives.

### **Motivations for Eating as predictors of Binge eating**

A hierarchical regression analysis was conducted with the aim to investigate the role of Motivations for Eating as predictors of Binge eating. For this analysis, we entered gender (males = 0, female = 1) in step 1. Findings indicated that gender significantly predicted Binge eating,  $\beta = .17$ ,  $p < .01$  at step 1, but failed to predict Binge eating when motivations were entered in step 2. We enter into the regression only the motivations resulted significantly correlated to Binge eating, that is Environmental, Emotional and Social Eating. Motivations for Eating significantly predicted Binge eating,  $R^2 = .50$ ,  $F(4,297) = 74.23$ ,  $p < .001$ , with Emotional Eating emerging as a significant positive predictor of Binge eating,  $\beta = .65$ ,  $p < .001$ , as well as Environmental Eating,  $\beta = .16$ ,  $p < .01$  (Table 3).

Table 3. Hierarchical regression analysis for Motivations for Eating predicting Binge eating

Predictor	Binge eating				
	<i>B</i>	<i>SE B</i>	$\beta$	$R^2$	$\Delta R^2$
Step 1				.03	.03
Gender	-.17	.50	-.01		
Step 2				.50	.47
Environmental Eating	.12	.04	.16*		
Emotional Eating	.24	.02	.65**		
Social Eating	-.05	.08	-.03		

Note: The tabled values for Beta reflect Bs after step 2. Gender was coded as 0 (males) and 1 (females).

\*  $p < .01$ , \*\* $p < .001$ .

### Drinking Motives as predictors of Binge drinking

In order to analyze the contributing role of the different Drinking Motives in predicting Binge drinking, we performed a hierarchical regression analysis. Gender (coded as 0 for males and 1 for females) was entered in step 1. Findings showed that gender was not a significant predictor of binge drinking,  $\beta = -.04$ ,  $p = .535$ . In the following step only the Drinking Motives which were related to Binge drinking were entered: Enhancement, Social and Coping motives. Drinking motives significantly predicted Binge drinking,  $R^2 = .11$ ,  $F(4, 208) = 6.56$ ,  $p < .001$ , with Enhancement motives resulted as significant and positive predictor of Binge drinking,  $\beta = .16$ ,  $p < .05$ , accounting for 11% of the variance (Table 4).

*Table 4. Hierarchical regression analysis for Drinking motives predicting Binge drinking*

Predictor	Binge drinking				
	<i>B</i>	<i>SE B</i>	$\beta$	$R^2$	$\Delta R^2$
Step 1				.00	.00
Gender	-.03	.10	-.02		
Step 2				.11	.11
Enhancement	.07	.03	.16*		
Social	.06	.03	.15		
Coping	.04	.03	.11		

*Note:* The tabled values for Beta reflect Bs after step 2. Gender was coded as 0 (males) and 1 (females).  
\*  $p < .05$ .

## **Discussion**

The present study aimed to investigate motivations underlying binge drinking and binge eating in a sample of adolescents. To our knowledge, this is the first study so far that explored motivations for both bingeing behaviors. In accordance with previous research (e.g., Boggiano et al., 2014; Graziano et al., 2012; Haedt-Matt & Keel, 2001; Kuntsche et al., 2006), our findings showed that both binge eating and binge drinking may be motivated by the same desire to avoid or just reduce negative affective states perceived. Indeed, it has been suggested that binge drinkers and eaters may use the substance consumed (alcohol or food) to influence and alter emotions, especially aversive ones, as they are found to report high levels of negative affect (e.g., Ferriter & Ray, 2011; Markey & Vander Wal, 2007; Veilleux et al., 2014). Thus, coping (or emotional) motives may be a shared characteristic that can help to clarify the link between these behaviors.

Furthermore, our study highlighted an interesting result; both bingeing behaviors were also associated with social motives. This finding is consistent both with earlier studies, which showed that binge drinking may be triggered by a desire to facilitate social interactions (e.g., Carrus et al., 2016;

Lyvers et al., 2010; Van Damme et al., 2013) and with Laghi et al. (2015) who found an association between binge eating and the tendency to consume food when taking part in social occasions. In addition to regulate negative affect, social reasons may play an important role in the engagement of bingeing episodes in adolescents. The consumption of both food and alcohol may occur when adolescents are involved in social activities where probably they strongly perceive the peer pressure to adhere to group norms and engage in such risk behaviors. Indeed, it has been noted (Laghi et al., 2012b; Lai et al., 2013) that adolescents who binge eat and drink are exposed to social pressure and tend to conform to peer group norms.

In addition, as we hypothesized, we found an association between binge drinking and enhancement motives, which resulted a positive and significant predictor of this behavior. This result is in line with existing literature which showed that young people tend to binge drink not only for regulating negative emotions, but also positive ones, so that they may be motivated to engage in binge drinking by the desire to enhance pleasant emotions, such as to have fun and get drunk (e.g., Carrus et al., 2016; Engels et al., 2005; Van Damme et al., 2013).

Moreover, eating in response to environmental stimuli, such as the sight or the smell of an attractive food, watching an advertising on television, resulted a significant predictor of binge eating. Our finding is consistent with previous studies, which underlined that this risk behavior may be triggered by sensory and environmental cues strictly related to food, including preparing food, passing by a favorite fast food place and watching a movie (Laghi et al., 2015; Schmidt, 2000; Waters, Hill, & Waller, 2001b).

Thus, the present study supports the argument that the reasons why adolescents engage in bingeing behaviors may be similar and mainly involve the regulation of emotions; probably they have not learned different mechanisms to regulate emotional states and use the engagement in these two addictive behaviors in order to reduce aversive states as loneliness, anxiety, boredom and frustration or in order to increase the level of positive ones, such as excitement and enjoyment. In addition, both

behaviors may also be triggered by consuming alcohol or food in a social setting, where adolescents may be more sensitive and exposed to peer pressure to binge drink or binge eat.

The current study has several strengths. Unlike the majority of research on the topic, which mainly involved college students, our study included a sample of adolescents. Furthermore, to our knowledge this is the first study so far, which was focused on investigating motivations both for binge drinking and binge eating; indeed, clarifying the common features and functions of bingeing behaviors may have important implications for a common etiological pathway.

Although the present research provides an important contribution to the literature regarding bingeing behaviors, results of this study should be considered in the context of some limitations. First, all the variables were assessed using self-report measures, therefore they might be subject to self-report bias. Second, the cross-sectional design limits us from distinguishing the causal relations between the variables. Third, the current study was performed on a school-based sample of adolescents, thus this may limit the generalizability of our findings.

Despite these limitations, the present research has suggestions for future empirical studies. First of all, future studies should replicate the findings implementing longitudinal design to ascribe causality to the related variables examined. It would be also interesting for future research to examine how motivations interact with some common personality traits (e.g., urgency or neuroticism) in order to better understand whether they can reinforce bingeing behaviors and contribute to their onset and maintenance in adolescents; indeed, an integrative approach is needed in order to better understand the underlying mechanisms of their etiology.

Finally, important implications arise from the present findings. This study showed that binge drinking and binge eating may share common functions; thus, integrated health programmes focusing simultaneously on these two behaviors, should be the most advisable. In particular, given that this study confirms that the engagement in both binge eating and binge drinking are mainly motivated by the need to regulate emotions, future prevention programs should be designed to train adolescents to use more adaptive and effective strategies to manage emotions, rather than using alcohol or food as

a way to reach the coping goals only temporarily. Moreover, since these behaviors are resulted to be also influenced by social factors that may be strictly related to social and peer influence, a training in resistance-skills should be useful in order to help adolescents not to engage in bingeing behaviors because they perceive pressure from others to drink or eat.

## **CHAPTER III**

Study 2: Drunkorexia among adolescents: the role of motivations and emotion regulation

## Study 2

### **Drunkorexia among adolescents: the role of motivations and emotion regulation**

#### **Current study**

The current study aimed at contributing to the investigation of drunkorexia, a behavior that is still understudied and existing research on this topic was mainly focused on college students, in particular females; to our knowledge only one study was performed on a sample of adolescents.

The goal of the present study was threefold. The first goal was to investigate whether various disordered eating behaviors (e.g., compensatory behaviors, binge eating, body dissatisfaction and weight concern), as well as aspects of alcohol consumption (binge drinking and drunkenness), are related to drunkorexia in a sample of male and female adolescents. In particular, we aimed to investigate whether drunkorexia is most strongly related to disordered eating behaviors or alcohol use. The second goal was to examine motivations that may drive adolescents to engage in drunkorexia. Finally, the third goal was to analyze the relation between drunkorexia and different dimensions of emotion dysregulation.

Specifically, consistent with past research (e.g., Bryant et al., 2012; Piazza-Gardner & Barry, 2012; Roosen & Mills, 2015), we hypothesized that adolescents who engage in drunkorexia would show more eating disordered behaviors and alcohol use, compared to adolescents who do not restrict food prior to drinking alcohol. Moreover, in line with Hunt and Forbush (2016), we hypothesized that drunkorexia would be related to both disorderd eating and alcohol use in both male and female adolescents, even though it would be more strongly related to disordered eating in females. In addition, in line with Ward and Galante (2015), we expected that drunkorexia would be associated with both enahancement and conformism motives among adolescents. To our knowledge, this is the first study which explored the association between emotion dysregulation and drunkorexia. Consistent with previous studies (e.g., Aldao et al., 2010; Nolen-Hoeksema, 2012; Veilleux et al.,

2014; Weiss et al., 2015), which underlined that disordered eating and alcohol use are associated with difficulties regulating emotions, we hypothesized that drunkorexia would be associated with emotion dysregulation. Due to the lack of research on this topic, we do not provide a priori hypotheses about which dimensions of emotion dysregulation would predict drunkorexia behaviour and whether or not there would be gender differences.

## **Methods**

### **Participants and Procedure**

A total of 1028 adolescents took part in the present study. Of those, 24 participants were excluded because they did not complete all the required measures. The final sample consisted of 1004 adolescents (609 females and 395 males) with a mean age of 17.86 years ( $SD=.83$ ; range 16-21).

Participants were recruited from various high schools from the centre and the south of Italy, both in urban, suburban and rural areas. Schools' selection was based on their willingness to take part in the current research, thus the resulting sample was voluntary. Each school was contacted by sending letters where objectives and procedures of the study were explained. After obtaining acceptance from schools' Principals to participate at the study, informed-consent forms, together with an information letter for students' parents to explain the general aim of the study were delivered to students, and only individuals who returned affirmative parental consent were invited to participate. Participation was voluntary and consisted of the administering of self-reported questionnaires during regular class time and took approximately 45 minutes to complete. Anonymity of results were guaranteed and ensured.

## **Measures**

### *Eating behaviours*

The Eating Disorders Inventory -3 (EDI-3; Garner, 2004) is an instrument consisting of 91 items and 12 subscales aimed to measure psychological traits or symptoms that are relevant in the development and maintenance of eating disorders. Subscales are divided into 3 eating disorder-specific scales (Drive for Thinness, Bulimia and Body Dissatisfaction) and 9 general psychological scales that are relevant but are not specific for eating disorders (Low Self-Esteem, Personal Alienation, Interpersonal Insecurity, Interpersonal Alienation, Interceptive Deficits, Emotional Dysregulation, Perfectionism, Maturity Fears and Asceticism). Besides 12 primary scores, EDI-3 provides also six composite scores: Eating Disorder Risk Composite, Ineffectiveness Composite, Interpersonal Problems Composite, and General Psychological Maladjustment Composite.

In accordance with the purpose of the present study, only the 3 eating disorder-specific scales were used.

The Italian version of EDI-3 (Giannini, Pannicchia, Dalle Grave, Muratori, & Viglione, 2008) has shown good psychometric properties. Internal reliability of the scales range from .80 and .90, and test-retest reliability coefficients for the composite scales are between .93 and .98.

In the present study, internal consistency for Drive for Thinness was .91, for Bulimia was .77 and for Body Dissatisfaction was .87.

Binge Eating Scale (BES; Gormally, Daston, & Rardin, 1982) is a self-administered instrument composed of 16 items, 8 addressed to describe behavioral manifestations of binge eating (e.g. eating large amounts of food) and 8 addressed to describe feelings and cognitions related to a binge episode (e.g. guilt and fear of being unable to stop eating). Each question includes three or four weighted statements that indicate a different range of severity for every binge eating characteristic. Participants are invited to choose the statement that best reflects their eating behavior. The BES yields a total

score by adding the individual values for each item ranging from a minimum of 0 to a maximum of 46.

Psychometric analyses have shown that BES has good test–retest reliability ( $r = .87, p \leq .001$ ) and concurrent validity, showing significant moderate associations with food record measures of binge eating severity ( $r = .29-.40, p < .05$ ) (Timmerman, 1999). BES translation has been validated by the NetWorking Team Group of the Italian Society for Eating Behavior Disorders (Dalle Grave, Calugi, Corica, Di Domizio, & Marchesini, 2009) and preliminary psychometric analyses have shown its internal consistency and concurrent validity (Dalle Grave, Calugi, Petroni, Di Domizio, & Marchesini, 2010; Dalle Grave et al., 2009; Mannucci, Petroni, Villanova, Rotella, Apolone, Marchesini et al., 2010; Ricca, Mannucci, Moretti, Di Bernardo, Zucchi, Cabras et al., 2000). The cronbach’s alpha for BES in the current study was .83.

Added questions asked participants to indicate how often they engage in compensatory behaviours as fasting, vomiting, use of laxatives (answer options ranged from a minimum to “never” to a maximum of “daily”) and to report their degree of weight concern (answer options ranged from a minimum to “none” to a maximum of “extreme”).

Self-reported weight and height were used to calculate Body Mass Index (BMI).

### *Alcohol consumption*

Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) is brief alcohol screen used to identify a risky or harmful alcohol consumption. It is the brief version of the Alcohol Use Disorders Identification Test (AUDIT; Babor, De La Fuente, Saunders, & Grant, 1992), from which it takes only the first three questions which assess different dimensions of alcohol consumption: 1) “How often do you have a drink containing alcohol?”; 2) “How many drinks containing alcohol do you have on a typical day when you are drinking?”; 3) “How often do you have six or more drinks on one occasion?”. The score for each response ranges from 0 to 4 points. The minimum final score is 0, the maximum is 12. In men, a score of 4 or more is considered positive, optimal for identifying hazardous

drinking or active alcohol use disorders. Whereas in women, a score of 3 or more is considered positive.

AUDIT translation has been validated by Piccinelli, Tessari, Bortolomasi, Piasere, Semenzin, Garzotto et al. (1997) and preliminary analyses of the short version of AUDIT has demonstrated its validity and effectiveness as a screening test for problem drinking (Struzzo, De Faccio, Moscatelli, & Scafato, 2006).

Other questions were added asking participants to report “how many times they got drunk in the last month” and to specifically assess binge drinking, we used the following question: “Considering all types of alcoholic beverages, how many times did you drink 5 or more drinks (for men) or 4 or more drinks (for females) on a single occasion in the last two weeks?”

#### *Drunkorexia*

To assess drunkorexia, participants were asked to answer a single item used in previous studies (Giles et al., 2009; Eisenberg & Fitz, 2014): “How many times in the past 30 days you have restricted food or calories before drinking an alcoholic beverage?”.

Following Eisenberg and Fitz (2014), participants who reported to engage in drunkorexia and restrict food or calories on days they planned to drink alcohol at least once in the past month, were categorized as “restrictors”, whereas those who did not indicate to restrict their food or calories were categorized as “non-restrictors”.

#### *Drunkorexia motives*

Drunkorexia Motives and Behaviors Scale (Ward & Galante, 2015) consists of twenty-three items on Likert type-scale ranging from never (1), almost never (2), sometimes (3), almost always (4), and always (5). It includes two factors: Drunkorexia Motives (11 item) concerning the reasons why individuals engage in drunkorexia (sample item, “On a day I planned to drink, I controlled my eating, so that I can drink without feeling left out”) and Drunkorexia Behaviors (12 items) relating to different

behaviours associated with drunkorexia (sample item, “On a day I planned to drink, I controlled my eating, to keep my caloric level under a certain level”). The instrument is based on Cooper’s (1994) motivational model, stating that individuals engage in alcohol consumption for four different reasons: social (drinking to improve interpersonal relationships), coping (drinking to mitigate negative emotions), enhancement (drinking to increase positive emotions) and compliance (drinking to be part of a group).

For the purpose of the study, only the items of Drunkorexia Motives subscale were used.

In the absence of an Italian version of the scale, a translation and adaptation procedure was carried out; it included a first step, in which the original English version was translated by two independent translators with a good knowledge of the English language and the psychological lexicon, in order to verify the equivalence of items’ meaning between the two versions of the subscale. Later, their translations were compared until getting to a common version. In a second step, the common version was translated into English by an independent bilingual professional, blind to the content of the original version. After a subsequent comparison with the original version, the final Italian version was obtained.

Furthermore, in order to determine the factor structure of the Drunkorexia motives subscale, a factor analysis using principal components analysis was conducted. Analysis of the eigenvalues and the scree plot suggested that a two-factor solution was the best fit for the data. The two factors together accounted for a total of variance of 56,18%. Factor 1 consisted of 7 items that reflected Conformism motives, whereas Factor 2 consisted of 4 items and indicated Enhancement motives. Internal consistency coefficients were satisfactory for both Enhancement ( $\alpha=.87$ ) and Conformism motives ( $\alpha=.80$ ).

### *Emotion regulation*

Difficulties in Emotion regulation scale (DERS; Gratz & Roemer, 2004). DERS is a self-report scale measuring emotion regulation difficulties across six different dimensions: 1) non-acceptance of

emotional responses that reflects a tendency towards negative secondary responses to negative emotions, and/or denial of distress; 2) inability to engage in goal-directed behaviours that reflects problems concentrating and accomplishing tasks while experiencing negative emotions when experiencing negative emotions; 3) difficulties controlling impulsive behaviours when experiencing negative emotions; 4) lack of emotional awareness that captures the difficulties in paying attention to emotional responses 5) limited access to emotion regulation strategies that are perceived as effective, that reflects the belief that there is little that a person can do to regulate one's emotions effectively, once an individual is upset; 6) lack of emotional clarity, that reflects the extent to which individuals are unclear about the emotions they are experiencing. In the current study, the internal consistency coefficients (alphas) of the six subscales were .80, .82, .82, .66, .87 and .82 respectively.

The scale is composed of 36 items rated on a 5-point scale ranging from 1 (almost never) to 5 (almost always). DERS has been found to be a reliable measure and has shown adequate construct and predictive validity (Gratz & Roemer, 2004). The Italian version of the scale (Giromini, Velotti, de Campora, Bonalume, & Zavattini, 2012) has shown to be a valid and reliable assessment tool; preliminary psychometric data have supported its concurrent validity, internal consistency and test-retest reliability (Fossati, Gratz, Maffei, & Borroni, 2014; Garofalo, Holden, Zeigler-Hill, & Velotti, 2015; Giromini et al., 2012).

### **Statistical Analysis**

Data were analyzed using SPSS Statistics Version 23.0. Before proceeding with analyses, missing data were replaced with the item mean for the entire sample.

Chi-square tests were performed in order to investigate gender and age differences between restrictors and non-restrictors. A series of MANOVAs with gender and drunkorexia (restrictors =1; non-restrictors = 0) as between-subjects factors were conducted on Eating Disorders Inventory-3 subscales, Drive for Thinness, Bulimia and Body Dissatisfaction and on compensatory behaviors such

as fasting, vomiting and use of laxatives, and weight concern. For these multivariate analyses, Wilks'  $\lambda$  criterion was used. An analysis of variance was carried out on Binge Eating Scale Total score. Partial eta-squared values were calculated as a measure of effect size, and results were interpreted using Cohen's (1988) guidelines for determining small (.01), medium (.06), and large (.14) effects.

Next, participants were first categorized as non-drinker, social drinker and binge drinker, according to their drinking frequency and binge episodes; then they were categorized as having or not hazardous drinking patterns, according to the score obtained at the AUDIT-C questionnaire. Chi square tests were performed in order to investigate the differences between restrictors and non-restrictors with respect to types of drinker. A series of MANOVAs with gender and drunkorexia as between-subjects factors were conducted on the variable "Drunkness in the last month", DERS dimensions and Drunkorexia motives.

Pearson correlations were conducted to examine the relationship among the key variables: drunkorexia, age, BMI, compensatory behaviors (fasting, vomiting and use of laxatives) weight concern, body dissatisfaction, drive for thinness, binge eating, DERS dimensions, binge drinking, drunkness in the last month and drunkorexia motives, separately for male and female subsamples.

We performed preliminary analyses to verify assumptions of hierarchical regression and exclude the possibility of collinearity. Regression analysis was performed in five steps, with drunkorexia as dependent variable, separately for males and females: compensatory behaviors (fasting, vomiting, use of laxatives) and weight concern were entered in step 1, followed by eating disorders (drive for thinness, body dissatisfaction and binge eating) in step 2. DERS dimensions were entered in step 3 and variables of alcohol consumption (binge drinking and drunkness in the last month) were entered in step 4. Finally, drunkorexia motives (enhancement and conformism motives) were entered in step 5.

## Results

### **Drunkorexia: gender and age differences**

The sample was composed of 117 (12%) adolescents who reported restricting food or calories prior to consuming alcohol at least once in the past 30 days, and 873 (87%) non-restrictors.

Chi-square tests were performed in order to examine whether there were gender and age differences between restrictors and non-restrictors. No significant differences for gender,  $\chi^2 = (1) = .10, p = .75$ , and age  $\chi^2 = (2) = .03, p = .99$  were found.

### **Drunkorexia and eating disorders**

Descriptive statistics for the key variables used in the present study are presented in Table 5.

Table 5. Descriptive statistics for EDi-3 subscales, binge eating, compensatory behaviors, weight concern, drunkenness in the last month, DERS dimensions and Drunkorexia motives

Variables	Males		Females		Restrictors		Non-restrictors	
	N=395		N=609		N=117		N=873	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
1. Drive for thinness	7.32	.62	13.38	.51	12.09	.76	8.61	.28
2. Bulimia	5.89	.40	5.82	.33	7.04	.49	4.68	.18
3. Body dissatisfaction	11.18	.71	18.51	.59	16.33	.87	13.36	.32
4. Binge eating	8.60	.51	10.67	.42	11.12	.62	8.16	.51
5. Fasting	.59	.09	1.00	.08	1.05	.11	.55	.04
6. Vomiting	.45	.09	.55	.08	.59	.11	.41	.04
7. Use of laxatives	.16	.09	.46	.08	.34	.11	.28	.04
8. Weight concern	1.84	.13	2.57	.11	2.42	.16	1.98	.06
9. Drunkenness in the last month	.82	.07	.43	.06	.96	.09	.29	.03
10. Non-acceptance	12.96	.39	14.42	.32	14.46	.47	12.92	.17
11. Goals	14.51	.36	16.52	.30	16.25	.44	14.78	.16
12. Impulse	15.00	.41	15.30	.34	16.41	.50	13.89	.18
13. Awareness	15.64	.33	15.21	.27	15.38	.40	15.46	.15
13. Strategies	17.35	.54	19.89	.45	19.63	.65	17.61	.24
14. Clarity	10.58	.33	11.56	.27	11.51	.40	10.63	.15
15. Enhancement motives	6.57	.20	6.26	.17	7.46	.25	5.37	.09
16. Conformism motives	8.47	.17	7.82	.14	8.60	.20	7.69	.07

Factorial MANOVA on Eating Disorders Inventory-3 subscales, Drive for thinness, Bulimia and Body Dissatisfaction, showed both significant main effects of gender,  $\lambda = .92$ ,  $F(3,984) = 30.12$ ,  $p < .001$ ,  $\eta_p^2 = .08$ , and drunkorexia,  $\lambda = .97$ ,  $F(3,984) = 9.34$ ,  $p < .001$ ,  $\eta_p^2 = .03$ . There was no significant effect of the interaction between gender and drunkorexia,  $\lambda = 1.00$ ,  $F(3,984) = 1.44$ ,  $p = .23$ . Results from the univariate tests revealed that males and females differed both on the subscale of Drive for thinness,  $F(1,986) = 56.54$ ,  $p < .001$ ,  $\eta_p^2 = .05$  and Body dissatisfaction,  $F(1,986) = 62.99$ ,  $p < .001$ ,  $\eta_p^2 = .06$ , where females showed a higher mean score than males. Furthermore, significant differences were found between adolescents who engage in drunkorexia and adolescents who do not

restrict food before drinking alcohol, on all the three subscales, Drive for thinness,  $F(1,986) = 18.70$ ,  $p < .001$ ,  $\eta_p^2 = .02$ , Bulimia,  $F(1,986) = 20.36$ ,  $p < .001$ ,  $\eta_p^2 = .02$  and Body dissatisfaction,  $F(1,986) = 10.30$ ,  $p = .001$ ,  $\eta_p^2 = .01$ . These results revealed that adolescents who engage in drunkorexia obtained higher scores both for Drive for Thinness, Bulimia and Body dissatisfaction, than those who do not restrict food prior drinking alcohol.

Factorial ANOVA on Binge Eating Scale, showed both main effect of gender,  $F(1,986) = 9.87$ ,  $p < .01$ ,  $\eta_p^2 = .01$ , and drunkorexia,  $F(1,986) = 20.14$ ,  $p < .001$ ,  $\eta_p^2 = .02$ . No significant effect of the interaction between gender and drunkorexia was found,  $F(1,986) = 3.48$ ,  $p = .06$ . These results demonstrate that females had an higher average score than males, and that adolescents who restrict their intake of food or calories prior to consuming alcohol had higher scores than non-restrictors.

### **Drunkorexia and compensatory behaviors**

Factorial ANOVA on fasting revealed both a main effect of gender,  $F(1,981) = 11.46$ ,  $p = .001$ ,  $\eta_p^2 = .01$ , and Drunkorexia,  $F(1,981) = 16.70$ ,  $p < .001$ ,  $\eta_p^2 = .02$ , but no effect of the interaction between gender and drunkorexia was found,  $F(1,981) = .34$ ,  $p = .56$ .

The present results indicated that females obtained higher mean score than males; furthermore, adolescents who engage in drunkorexia obtained higher mean scores than adolescents who reported no episodes of drunkorexia in the last 30 days.

Factorial ANOVA on vomiting, showed neither main effect of gender,  $F(1,980) = .63$ ,  $p = .43$ , nor of drunkorexia,  $F(1,980) = 2.40$ ,  $p = .12$ . The effect of the interaction between gender and drunkorexia was not significant,  $F(1,980) = .01$ ,  $p = .93$ .

For use of laxatives, factorial ANOVA showed only main effect of gender,  $F(1,979) = 5.80$ ,  $p < .05$  but not of drunkorexia.  $F(1,979) = .25$ ,  $p = .61$ , indicating that the mean score of use of laxatives was significantly higher for females than males. No effect of the interaction between gender and drunkorexia was found,  $F(1,979) = 1.07$ ,  $p = .30$ .

Factorial ANOVA on weight concern, showed both a main effect of gender,  $F(1,966) = 17.88, p < .001$  and drunkorexia,  $F(1,966) = 6.41, p < .05$ . There was no significant effect of the interaction between gender and drunkorexia,  $F(1,966) = .62, p = .43$ . These results revealed that females had higher average score than males, whereas restrictors obtained higher mean score than non-restrictors.

### **Drunkorexia and alcohol consumption**

According to their alcohol consumption, respondents were first categorized as non-drinkers (no consumption of alcohol), social drinkers (drinking frequency ranges from less than once a month/once a month to two-four times a month) and binge drinkers (at least one but less or equal than 4 binge drinking episodes in the last two weeks). In the present study, the sample was composed of 172 non-drinkers (17%), 525 social drinkers (52%) and 247 binge drinkers (25%). A chi-square test was performed in order to investigate whether there were differences between restrictors and non-restrictors with respect to the drinking groups (social and binge drinkers). Results revealed a significant difference,  $\chi^2(1) = 67.17, p < .001$ , so that restrictors were more likely to be classified as binge drinkers (68% of restrictors vs 27% of non-restrictors) and non-restrictors were more likely to be classified as social drinkers (73% of non-restrictors vs 32% of restrictors).

Next, participants were categorized as indulging or not in hazardous drinking, according to the AUDIT-C scores. In the present sample, 265 (26%) were classified as having hazardous drinking patterns and 737 (73%) as not indulging in hazardous drinking. Chi-square test highlighted a significant difference between restrictor and non-restrictors with respect to these drinking groups,  $\chi^2(1) = 50.00, p < .001$ ; restrictors were more likely to be classified as having hazardous drinking (54% of restrictors vs 23% of non-restrictors) and non-restrictors were more likely to be classified as not having an hazardous alcohol consumption (77% of non-restrictors vs 46% of restrictors).

Factorial ANOVA on drunkenness in the last month, revealed both a significant main effect of gender,  $F(1,979) = 15.80, p < .001, \eta_p^2 = .02$ , and drunkorexia,  $F(1,979) = 46.87, p < .001, \eta_p^2 = .05$ , but no effect of the interaction between gender and drunkorexia was found,  $F(1,981) = 1.22, p = .27$ .

The results indicated that males obtained higher mean score than females and restrictors had higher mean score than non-restrictors.

### **Drunkorexia and motivations**

Factorial MANOVA on Drunkorexia motives, showed both significant main effect of gender,  $\lambda = .99$ ,  $F(2,985) = 4.53$ ,  $p < .05$ ,  $\eta_p^2 = .01$ , and drunkorexia,  $\lambda = .94$ ,  $F(2,985) = 31.21$ ,  $p < .001$ ,  $\eta_p^2 = .06$  and a significant effect of the interaction between gender and drunkorexia,  $\lambda = .99$ ,  $F(2,985) = 4.16$ ,  $p < .05$ ,  $\eta_p^2 = .01$ . Results from the univariate tests revealed that males and females differed on Conformism motives,  $F(1,986) = 9.04$ ,  $p < .01$ ,  $\eta_p^2 = .01$ , where males obtained higher mean score than females and restrictors and non-restrictors differed both on Enhancement,  $F(1,986) = 61.81$ ,  $p < .001$ ,  $\eta_p^2 = .06$ , and Conformism motives,  $F(1,986) = 17.71$ ,  $p < .001$ ,  $\eta_p^2 = .02$ , so that restrictors had higher average scores than non-restrictors. Furthermore, results demonstrated that for Enhancement motives,  $F(1,986) = 4.17$ ,  $p < .05$ ,  $\eta_p^2 = .004$ , female restrictors obtained higher mean score than the other groups.

### **Drunkorexia and emotion regulation**

Factorial MANOVA on DERS dimensions, showed both significant main effect of gender,  $\lambda = .97$ ,  $F(6,981) = 5.69$ ,  $p < .001$ ,  $\eta_p^2 = .03$ , and drunkorexia,  $\lambda = .98$ ,  $F(6,981) = 3.94$ ,  $p = .001$ ,  $\eta_p^2 = .02$ . There was no significant effect of the interaction between gender and drunkorexia,  $\lambda = .98$ ,  $F(6,981) = .98$ ,  $p = .43$ . Results from the univariate tests revealed that males and females differed on Non-acceptance,  $F(1,986) = 8.41$ ,  $p < .01$ ,  $\eta_p^2 = .01$ , Goals,  $F(1,986) = 18.14$ ,  $p < .001$ ,  $\eta_p^2 = .02$ , Strategies  $F(1,986) = 13.25$ ,  $p < .001$ ,  $\eta_p^2 = .01$ , and Clarity,  $F(1,986) = 5.29$ ,  $p < .05$ ,  $\eta_p^2 = .01$ , where females showed a higher mean scores than males. Furthermore, significant differences were found between restrictors and non-restrictors on all the DERS dimensions, except for Awareness, so that adolescents who engage in drunkorexia obtained higher mean scores than those who do not restrict food before drinking alcohol.

### **Correlations among study variables**

Pearson correlations, separately by gender, were performed to examine the relationship among the key variables used in the present study: drunkorexia, age, BMI, compensatory behaviors, weight concern, Body dissatisfaction, Drive for thinness, Binge eating, DERS dimensions, binge drinking, drunkenness in the last month and Drunkorexia motives (Table 6).

For male subsample, drunkorexia was significantly and positively correlated with fasting, Drive for thinness, Body dissatisfaction, Binge eating, DERS subscales such as Goals, Impulse, Strategies and Clarity, binge drinking, drunkenness in last month, Conformism and Enhancement motives. For female subsample, drunkorexia was significantly associated with fasting, use of laxatives, Drive for thinness, DERS dimensions such as Impulse and Strategies, binge drinking, drunkenness in the last month, Enhancement and Conformism motives.

Table 6. Correlations among the variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Drunkorexia	–	.22**	.05	-.03	.09	.01	.16**	.10*	.16**	.08	.13*	.19**	.05	.10*	.18**	.32**	.36**	.16**	.16**	.03
2. Fasting	.11**	–	.48**	.40**	.22**	.01	.22**	.11*	.13*	.06	.03	.05	.03	.05	.07	.22**	.16**	.14**	.11*	.12*
3. Vomiting	.04	.38**	–	.37**	.14**	.09	.10*	.02	.11*	.11*	.10*	.06	.02	.08	.08	.21**	.12*	.18**	.17**	.04
4. Use of laxatives	.09*	.30**	.48**	–	.04	-.003	.07	-.02	.11*	.08	-.003	.09	.06	.03	.07	.09	.08	.16**	.20**	.01
5. Weight concern	.02	.23**	.05	.01	–	.45**	.48**	.37**	.25**	.08	.05	.11*	.05	.11*	.05	.02	.02	-.02	.07	.06
6. BMI	-.005	.04	.02	-.05	.26**	–	.32**	.34**	.19**	-.03	-.04	-.08	.17**	-.02	.02	.01	.10	-.08	.04	.01
7. Drive for thinness	.10*	.29**	.11**	.06	.62**	.32**	–	.61**	.56**	.31**	.24**	.29**	.10*	.33**	.25**	.14**	.09	.15**	.24**	.10*
8. Body dissatisfaction	.05	.24**	.11**	.11**	.54**	.39**	.68**	–	.51**	.18**	.18**	.20**	.21**	.30**	.25**	.08	.01	.06	.16**	.10*
9. Binge eating	.06	.25**	.22**	.11**	.37**	.21**	.48**	.53**	–	.36**	.30**	.40**	.08	.43**	.33**	.11*	.07	.21**	.44**	.09
10. Non-acceptance	.07	.14**	.11**	.05	.21**	.05	.28**	.32**	.39**	–	.47**	.54**	-.08	.67**	.47**	.14**	.09	.18**	.28**	.02
11. Goals	.08	.07	.10*	.04	.18**	-.10*	.25**	.26**	.29**	.44**	–	.66**	-.10	.61**	.33**	.08	.06	.21**	.17**	.04
12. Impulse	.10*	.15**	.17**	.11**	.20**	-.02	.25**	.29**	.35**	.53**	.54**	–	.01	.62**	.40**	.09	.09	.21**	.20**	.01
13. Awareness	-.04	.08	.09*	.07	.12**	.15**	.15**	.25**	.20**	.03	-.05	.09	–	.01	.27**	.07	.08	-.002	.07	.03
14. Strategies	.09*	.18**	.16**	.08	.25**	.01	.31**	.38**	.46**	.68**	.58**	.66**	.08	–	.50**	.14**	.05	.19**	.27**	.05
15. Clarity	.06	.15**	.13**	.11**	.23**	.03	.21**	.30**	.33**	.43**	.29**	.40**	.34**	.49**	–	.18**	.12**	.18**	.23**	-.02
16. Drunkenness in the last month	.32**	.07	.13**	.06	.03	.04	.05	.08	.11**	.04	.07	.12**	-.01	.05	.09*	–	.52**	.35**	.16**	.06
17. Binge drinking	.43**	.05	.02	.06	.02	.02	.02	.105	.07	.02	.08*	.09*	.004	.05	.09*	.51**	–	.21**	.18**	.002
18. Enhancement motives	.31**	.13**	.13**	.10*	.05	.002	.15**	.08*	.18**	.14**	.09*	.24**	.01	.18**	.16**	.40**	.28**	–	.50**	.04
19. Conformism motives	.14**	.09*	.11**	.05	.10*	.07	.15**	.14**	.22**	.25	.05	.11**	.08*	.17**	.23**	.10*	.05	.39**	–	.03
20. Age	.05	.04	.02	.05	-.03	.001	-.08	.03	.01	.09*	.06	.05	.005	.07	.02	.06	.06	-.06	.04	–

Note. \* p < .05, \*\*p < .01. Values above the diagonal are computed for male subsample and values below the diagonal are computed for female subsample

## **Alcohol consumption, eating behaviors, emotion regulation and motivations as predictors of drunkorexia**

Preliminary, we verified that the assumptions of hierarchical regression were satisfied and checked for collinearity. Indicators of multicollinearity, tolerance and variance inflation factor (VIF), were all within accepted limits, thus, there was no issues with multicollinearity within the data (e.g., Coakes, 2005; Tabachnic & Fidell, 2001). Hierarchical multiple regression analysis was carried out with the aim to investigate the role of alcohol consumption, eating behaviors, difficulties in emotion regulation and motivations as predictors of drunkorexia, separately for males and females (Tables 7 and 8).

We decided not to include in the analyses “age” and “BMI” as control variables at step 1 as they did not result to be significant related to drunkorexia in both male and female subsample.

The hierarchical multiple regression analysis performed for males, revealed that compensatory behaviours entered in Step 1, accounted for 5% of the variance in drunkorexia, with fasting as significant and positive predictor, and use of laxatives as significant and negative predictor. In step 2, eating disorders were added to the model; findings showed that Drive for thinness, Body dissatisfaction and Binge eating were not significantly related to drunkorexia. Introducing DERS dimensions in step 3, an additional 3% of the variance in drunkorexia was explained, with Impulse and Clarity, emerging as significant predictors. In step 4 alcohol consumption variables were added and accounted for 13% of the variance in drunkorexia, with drunkenness in the last month and binge drinking, emerging as significant predictors. Finally, drunkorexia motives were entered in step 5; in this model, enhancement and conformism motives were not found to be related to drunkorexia.

The hierarchical multiple regression analysis carried out for females, showed that compensatory behaviours entered in Step 1, significantly predicted drunkorexia, accounting for 2% of the variance, with fasting emerging as a significant positive predictor. Results for Step 2 revealed that eating disorders explained an additional variance of 1%, with Drive for thinness emerging as a significant predictor of drunkorexia. In step 3, DERS dimensions were added to the model; results

showed that they were not related to drunkorexia. In step 4 drunkenness in the last month and binge drinking, emerged as significant positive predictors. Overall, alcohol consumption variables accounted for 18% of the variance in drunkorexia. Lastly, introducing drunkorexia motives in step 5, an additional 2% of the variance was explained. In this model enhancement motives emerged as a significant predictor; conformism motives were not found to be significantly related to drunkorexia.

*Table 7. Hierarchical regression analysis for variables predicting Drunkorexia in male subsample*

Predictor	<i>B</i>	<i>SE B</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	<i>df</i>	$\Delta F$
Step 1				.05	.05	4,368	4.93***
Fasting	.19	.05	.24***				
Vomiting	-.02	.04	-.03				
Use of laxatives	-.10	.05	-.12*				
Weight concern	.02	.03	.03				
Step 2				.07	.02	3,365	2.24
Drive for thinness	.01	.01	.08				
Body dissatisfaction	-.01	.01	-.06				
Binge eating	.01	.01	.11				
Step 3				.10	.03	6,359	2.28*
Non-acceptance	-.01	.01	-.06				
Goals	.003	.01	.02				
Impulse	.01	.02	.17*				
Awareness	.001	.01	.005				
Strategies	-.01	.01	-.09				
Clarity	.03	.01	.14*				
Step 4				.23	.13	2,357	29.58***
Drunkenness in the last month	.11	.03	.18**				
Binge drinking	.14	.03	.25***				
Step 5				.23	.001	2,355	.25
Enhancement motives	-.01	.01	-.03				
Conformism motives	.01	.02	.04				

*Note.* \*  $p < .05$ , \*\* $p < .01$ , \*\*\* $p \leq .001$ .

Table 8. Hierarchical regression analysis for variables predicting Drunkorexia in female subsample

Predictor	<i>B</i>	<i>SE B</i>	$\beta$	<i>R</i> <sup>2</sup>	$\Delta R^2$	<i>df</i>	$\Delta F$
Step 1				.02	.02	4,572	2.75*
Fasting	.05	.02	.11*				
Vomiting	-.02	.02	-.03				
Use of laxatives	.03	.02	.08				
Weight concern	-.002	.01	-.01				
Step 2				.03	.01	3,569	2.39
Drive for thinness	.01	.004	.15*				
Body dissatisfaction	-.001	.004	-.02				
Binge eating	.001	.004	.02				
Step 3							
Non-acceptance	-.002	.01	-.01	.04	.01	6,563	1.06
Goals	.002	.01	.02				
Impulse	.005	.01	.04				
Awareness	.001	.01	.005				
Strategies	-.01	.01	-.06				
Clarity	.01	.01	.04				
Step 4				.23	.18	2,561	66.85***
Drunkenness in the last month	.12	.04	.13**				
Binge drinking	.27	.03	.36***				
Step 5				.25	.02	2,559	9.10***
Enhancement motives	.03	.01	.13**				
Conformism motives	.03	.01	.08				

Note. \*  $p < .05$ , \*\* $p < .01$ , \*\*\* $p \leq .001$ .

## Discussion

The first goal of the present study was to analyze the relation between drunkorexia and disordered eating behaviors, as well as aspects of alcohol consumption such as binge drinking and drunkenness in a sample of male and female adolescents. With respect to disordered eating, our findings showed that adolescents who restrict calories on days they planned to drink alcohol, reported

more eating disorders symptoms, binge eating episodes, fasting and weight concern, compared to non-restrictors. This result is consistent with previous studies (e.g., Babiaz et al., 2013; Peralta, 2002; Piazza-Gardner & Barry, 2012; Roosen & Mills, 2015) which highlighted that young people who engage in drunkorexia are characterized by an extensive use of unhealthy eating-related behaviors and the fear of gaining weight due to the high content of calories in alcohol beverages.

In particular, the current study found that, among disordered eating behaviors, drunkorexia was related to fasting in both males and females; thus, compared to other dysfunctional eating behaviors, both male and female adolescents seem to prefer using fasting as a way to restrict calories prior to consuming alcohol. In addition, drunkorexia in females, was also associated with the use of laxatives and drive for thinness, which resulted, the latter, a significant and positive predictor of this behavior. This finding is in agreement with existing research (Barry et al., 2013; Eisenberg & Fitz, 2014) which underlined that females who engaged in drunkorexia, were more likely than males, to report preoccupation with weight, fear of gaining weight and the preference for compensatory behaviors as eating patterns used in order to control weight.

Conversely, drunkorexia in males was associated with binge eating episodes; the current finding can be explained in light of evidences which showed the link between binge eating and dietary restraint, suggesting that binge eating is the body's response to dieting (e.g., Grilo et al., 1994; Polivy & Herman, 1985). Specifically, theory on restriction-disinhibition claimed that restrained eaters tend constantly to limit their caloric intake and avoid some high calorie foods; nevertheless, some events, such as experiencing intense negative emotions or perceiving of having eating too much, may interrupt this rigid control and trigger the binging episode. Thus, they can often be characterized by a cycling alternation of excess and deprivation. Our result is in line with an earlier study (Hunt & Forbush, 2016), which highlighted that drunkorexia was related to binge eating only in male subsample; in addition, Greenwood, Broadbent, and Fuller-Tyszkiewicz (2014) showed that impulsive males were more likely to report this type of eating patterns, compared to females.

With respect to alcohol consumption, restrictors were more likely to report engaging in binge drinking, having hazardous drinking patterns and getting drunk, by comparison with adolescents who don't engage in drunkorexia. Furthermore, drunkorexia was associated with binge drinking and drunkenness in both males and females. This finding is in line with earlier research (Bryant et al., 2012; Giles et al., 2009) which showed that, those who restricted calories on days planned, were found to be more likely to get drunk in a typical week and engage in binge drinking to intensify the intoxicating effects of alcohol.

In addition, the present study found that both disordered eating and alcohol use were significant predictors of drunkorexia in both male and female adolescents. This result is consistent with Hunt and Forbush (2016), even though drunkorexia did not result to be more strongly related to disordered eating in females. Indeed, our finding suggested that compared to college students, disordered eating and alcohol use in adolescents similarly contribute to drunkorexia in both males and females. Besides the relation with disorderd eating, alcohol use seem to play an important role also in females; recent estimates have infact suggested, that a change in the trend of alcohol consumption is occurring among adolescents, with females increasing their frequency of engaging in binge drinking, being drunk and drinking to get drunk (e.g., ESPAD, 2015; Miller et al., 2007).

The second goal of our research was to investigate motivations underlying drunkorexia behavior in adolescents. Consistent with a previous study carried out in a sample of college students (Ward & Galante, 2015), our result found that adolescents engage in drunkorexia by the desire to enhance positive affect, as well as to comply with others. Thus, drunkorexia may be triggered by the need to be accepted by peers and not be left out, and by pressure from friends to engage in this behavior. It has been noted (Peralta, 2002) that drunkorexia seems to be a real social practice among young people, who can be pressed to adhere to peer group norms by drinking and reaching a socially acceptable body shape. In addition, drunkorexia may serve the function to make social gatherings more fun or to help enjoying a party, and this data seems to specifically characterize female subsample. This finding is in line with Bryant et al. (2012) who found gender differences in

motivations for drunkorexia; in particular, they noted that, females were more likely than males, to use this behavior in order to increase the effects of alcohol. Thus, females, more than be driven by conformity motives, may engage in restricting calories when drinking was planned, with the aim to have fun and feel the effects of alcohol.

The third and last goal of the current study was to explore the relation between drunkorexia and different dimensions of emotion dysregulation. To our knowledge, this is the first study so far which was aimed to explore this relationship. Our results showed that drunkorexia in both males and females was associated with difficulties controlling impulsive behaviors when experiences negative emotions and limited access to emotion regulation strategies; drunkorexia in males was also related to inability to engage in goal-directed behaviors and lack of emotional clarity. However, this study found that emotion dysregulation was a significant predictor of drunkorexia only in males; specifically, difficulties controlling impulsive behaviors and lack of emotional clarity, were positive and significant predictors of drunkorexia in male subsample. This finding suggests that, especially male adolescents, can use drunkorexia as a strategy of emotion regulation, in particular when they experience negative emotions and have no clarity regarding their emotional responses; our result seems to be consistent with earlier researches (Nolen-Hoeksema, 2012; Tamres, Janicki, & Helgeson, 2002) which highlighted that, compared to females who tend to use more passive responses to their emotions (such as rumination), males are more likely to use more active strategies and tend to engage in substance use, especially drinking alcohol, in order to avoid negative emotions. Indeed, it has been noted (Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006; Nolen-Hoeksema, 2012) that males showed less ability to exert voluntary control over emotional reactions than females, and, consequently, they can be more likely to engage in impulsive behaviors, such as drunkorexia, in response to negative emotions or lack of clarity of emotional affect. Therefore, males are more likely than females, to use emotion regulation strategies in attempts to control or change a situation believed to drive their emotions; thus males' use of maladaptive strategies puts them at increased risk for engaging in drunkorexia. Our result is in agreement with previous studies (e.g., Aldao et al., 2010; Nolen-

Hoeksema, 2012; Veilleux et al., 2014; Weiss et al., 2015) which underlined that emotion dysregulation is associated with several risk behaviors, including disordered eating and alcohol use. In addition, research suggests that males and females respond differently to emotion, and gender differences in the tendency to use certain specific emotion regulation strategies have been found; thus, gender differences in emotion regulation may contribute to the gender differences in certain types of maladaptive behaviors (Nolen-Hoeksema, 2012; Zahn-Waxler, Shirtcliff, & Marceau, 2008). Nevertheless, too little is known about the ways in which men regulate their emotions and more research should be addressed to better clarify and understand the complex relationship among emotion regulation, maladaptive behaviors and gender (Lafrance Robinson et al., 2014; Nolen-Hoeksema, 2012).

Despite the important contribution of the present study regarding drunkorexia behavior, it is important to consider some limitations; First, due to the cross-sectional design of our study, we were unable to explore causal associations; thus, results are needed to be examined with the implementation of a longitudinal design to test the course and long-term outcome of drunkorexia. Second, this research relied on self-report measures, thus, data may be subjected to inaccuracy and potential bias in the responses.

This study have also several important strengths. First of all, to our knowledge this study was the first to analyze the relation between drunkorexia and disordered eating behaviors, as well as aspects of alcohol consumption and motivations in a sample of adolescents; existing research has shown that adolescents are at high risk both for disordered eating and alcohol use. Furthermore, it is also the first study known, which explored the association of drunkorexia with dimensions of emotion regulation. Finally, the present research involved a large sample size; indeed several papers published on drunkorexia included small samples (e.g., Eisenberg & Fitz, 2014; Luce et al., 2013; Peralta, 2002; Roosen & Mills, 2015).

In addition, various directions for future research are suggested. First, due to the lack of research in this area on adolescents, more studies are needed to better clarify the dynamics associated

with the frequent and complex correlation between disordered eating and alcohol consumption in adolescents. Second, future studies should replicate the results including a longitudinal design which could help to better understand the temporal nature of the study variables and, in addition, to investigate long-term effects of drunkorexia. Moreover, in terms of emotion regulation and drunkorexia, researchers should also better clarify the role of gender; for instance, testing gender as possible moderator of this relationship. Finally, what is still missing, and it is the most important thing, is a standardized definition and systematic criteria, as well as standardized measures of calorie restriction prior to consuming alcohol, which take into consideration the complexity of the relation between disordered eating and alcohol use.

Finally our findings have important implications. The present study highlight the relevance of implement prevention programs focusing on an integrated approach on both of these interrelated behaviors, such as disordered eating and alcohol use. Specifically, the results suggest that health promotion efforts should also take into account the differences between males and females, in order to be more targeted and effective. For instance, males should be helped to find and use more adaptive strategies to regulate emotions, especially when they experience negative affect. Conversely, females should need to find and learn to use healthy strategies alternative to drunkorexia, which can help them to manage positive emotions, as drunkorexia is often triggered by the desire to enhance positive affect. In addition, future prevention and intervention programmes should be designed to minimize conformity motivations that may drive adolescents to engage in drunkorexia pressed by the need to conform both to body-image and drinking norms.

## **CHAPTER IV**

### **General discussion**

## **General discussion**

Adolescence is a period of life typically characterized by the tendency to explore new behaviors and by a great expression of risk-taking, recognized as normative part of developmental processes, contributing to the formation of identity and autonomy; however risk-taking behaviors can often endanger adolescents' health, compromise developmental tasks' achievement and are also related to several short and long-term unfavourable outcomes.

Specifically, the present dissertation was focused on investigating three prevalent risk behaviors among adolescents, such as binge drinking, binge eating and drunkorexia. Binge drinking and binge eating are two of the most serious health issues among young people and are related to several negative consequences, including physical and social problems, depressive and anxious symptoms and poor academic performance. Existing literature have highlighted that bingeing behaviors often co-occur among adolescents and share various features, such as, for instance, personality traits and affective and behavioral characteristics. Previous studies, focused on examining the underlying motivations for binge eating and binge drinking, showed that the needs or desires that may drive young people to the engagement of bingeing behaviors may be also similar and serve the same function; thus, a better understanding of the motives behind bingeing may shed light on the link between these two addictive behaviors among adolescents.

Although it has been well established that disordered eating and alcohol use tend frequently to co-occur, only recently the interest among scholars in a behavior named "drunkorexia" as been increased. Despite the growing attention, sistematic definition and criteria are still missing; however its core feature has been identified as a self-imposed calorie restriction on days when drinking consumption is planned. Different disordered eating beahviors have been reported in order to restrict food, such as fasting and compensatory behaviors; moreover, drunkorexia behavior seems to be triggered by different reasons, including the fear of gaining weight, intensify the effects of alcohol, as well as conformity and ehancement motives. Although since 2008, several studies were carried out on the argument, they were performed on college aged students, expecially on females. Only one

study known, was performed on a sample of adolescents. Thus, research on drunkorexia among adolescents is still understudied and to our knowledge no study so far, explored the reasons why adolescents may engage in this behavior and whether emotion regulation may play a role in predicting drunkorexia. In addition, although it represents the overlapping of disordered eating and alcohol consumption, it is unclear whether drunkorexia is more strongly related to substance use or unhealthy eating behaviors.

Thus, the current work was aimed to better understand and clarify the potential mechanisms and dynamics underlying these behaviors among adolescents. In particular, two studies were carried out to achieve our goals. Study 1 was aimed to examine the motivations that can lead adolescents to engage in binge drinking and binge eating. Only few studies have investigated the motivations for bingeing behaviors in adolescents and, moreover, to our knowledge this the first study to explore underlying motives for both of these behaviors.

Study 2 was aimed at contributing to the investigation of drunkorexia among adolescents. The goal of the present study was threefold; the first goal was to examine the relation between drunkorexia and various disordered eating behaviors, as well as aspects of alcohol use in male and female adolescents. More specifically, we aimed to explore whether drunkorexia was most strongly related to disorder eating or alcohol use. Futhermore, the second goal was to investigate motivations that may lead adolescents to engage in drunkorexia. The third and last goal was to explore the association between drunkorexia and different dimensions of emotion dysregulation; to our knowledge this is the first attempt addressed to his topic.

Our findings highlighted that binge drinking and binge eating may be triggered by the same motivations; adolescents seem to be motivated by the desire and need to regulate their emotions, because probably they have not learned to use more adaptive and healthy strategies, expecially when they experience intense negative emotions, such as loneliness, boredom or anxiety. In addition, our results suggest that adolescents may also engage in both bingeing behaviors because of driven by social reasons; thus, food or alcohol may be consumed when adolescents are involved in social activities,

where they are more exposed and sensitive to peer pressure to adhere to eating and drinking norms. Consistent with previous research, which suggests that motivations underlying both binge behaviors may be similar and perform the same function, our study attempted to better clarify the potential link that may contribute to a better understanding of a common etiology of binge drinking and binge eating.

Based on these findings, further research is needed in order to better understand the underlying mechanisms which may shed light on a common etiological pathway for binge behaviors. An integrative approach is suggested, which takes into consideration, the interaction of different factors; for instance, it would be interesting to examine how motivations may interact with other variables, such as personality traits (e.g., impulsivity and neuroticism) and with alcohol and eating expectancies, in order to better clarify whether they can reinforce binge behaviors and contribute to their onset and maintenance in adolescents. For instance, expectancies that binge behaviors may provide a relief from negative affect, are found to contribute indirectly to the engagement of binge drinking and binge eating, by influencing motivations underlying binge behaviors (e.g., Ferriter & Ray, 2011; Williams & Clark, 1998).

In addition, our work have provided further information on drunkorexia; in particular, the present findings showed that disordered eating and alcohol use in adolescents similarly contribute to drunkorexia in both males and females. In particular, use of fasting and engaging in binge drinking and getting drunk seem to play an important role in predicting drunkorexia in both male and female adolescents; nevertheless, our results highlighted also important gender differences. For instance, females were more likely than males, to report preoccupation with dieting and weight, concern about gaining weight and, besides fasting, using laxatives as eating behaviors exhibited prior to consuming alcohol beverages. Moreover, females were resulted to engage in drunkorexia mainly because of enhancement motives; thus, drunkorexia seems to be used as a strategy to enhance positive affect, such as to have fun or to get high when they drink. Conversely, males seem to be characterized by eating patterns which involve alternation of excess and deprivation that results in constantly limiting

caloric intake often accompanied by binge eating episodes, probably triggered by aversive emotional states. Indeed, our results suggest that drunkorexia in males is significantly predicted by difficulties regulating emotions; specifically male adolescents reported difficulties controlling impulsive behaviors when they experience negative emotions and clarity regarding their emotional responses.

In addition to provide an important and additional contribution to existing literature in this area, the results of the present study suggest the need of further research, in order to better understand the frequent and complex relationship between disordered eating and alcohol use in adolescents. Specifically, our findings suggest that drunkorexia is related to both disordered eating and alcohol consumption, indicating that adolescents may be at risk for developing both eating and substance use disorders; therefore, future studies should investigate long-term course and effects of drunkorexia. Indeed, little is known about health consequences of drunkorexia; it is established that disordered eating and excessive alcohol consumption are associated with several negative consequences, but the engaging in both behaviors concurrently may have a greater effect; for instance, skipping meals before consuming alcohol may lead to an increased toxicity of alcohol and result in more serious consequences.

It would be also important for future research to better investigate the relation between drunkorexia and emotion regulation; indeed, this was the first study known, which explored whether drunkorexia is associated with different dimensions of difficulties in emotion regulation. Specifically, our findings showed that drunkorexia is differently related to emotion regulation in males and females, so that males were resulted to be more likely to use maladaptive strategies of emotion regulation, which may put them at increased risk for engaging in drunkorexia. Thus, further studies are needed to deeply examine sex-based differences in the relation between drunkorexia and different dimensions of emotion regulation, in order to better clarify the contribute of gender in this relationship.

Moreover, in addition to better explore the antecedents and so, the motivations, which may lead to drunkorexia, future reserch should also consider the potential role of beliefs about the effects or

consequences that the engagement in drunkorexia may elicit. In fact, it has been noted (e.g., Ferriter & Ray; 2011; Moss & Albery. 2009; Smith, Simmons, Flory, Annus & Hill, 2007) the association between negative reinforcement expectancies and alcohol consumption, as well as disordered eating; thus, it would be interesting investigating whether expectancies may play an important role also in the engagement in drunkorexia. In addition, as for bingeing behaviors, expectancies may provide an indirect contribution to drunkorexia by influencing motivations behind this unhealthy behavior.

Furthermore, the present work underlined the importance of the implementation of prevention programmes in order to avoid or reduce the engagement in health-risk behaviors, taking into account the association and similarity between disordered eating behaviors and alcohol use. Specifically, our findings showed that adolescents may engage in both bingeing behaviors and drunkorexia in order to regulate emotional states; therefore, health promotion efforts should be designed to train adolescents to find and use more adaptive and effective strategies to manage emotions, rather than using alcohol or eating behaviors as a way to achieve their coping goals just temporarily. In addition, our results showed that these risk behaviors may be also triggered by the involvement in social activities, where probably adolescents can be more exposed to external demands, as well as by a desire to conform with peer groups norms; thus, adolescents should also be helped to develop skills useful to resist to peer and social pressure and not to engage in bingeing behaviors or drunkorexia in order to comply with others to be accepted and adhere to body-image and drinking norms.

## References

- Abraham, S. F., & Beumont, P. J. V. (1982). How patients describe bulimia or binge eating. *Psychological Medicine*, *12*(03), 625-635.
- Ackard, D. M., Croll, J. K., & Kearney-Cooke, A. (2002). Dieting frequency among college females: Association with disordered eating, body image, and related psychological problems. *Journal of Psychosomatic research*, *52*(3), 129-136.
- Agius, P., Taft, A., Hemphill, S., Toumbourou, J., & McMorris, B. (2013). Excessive alcohol use and its association with risky sexual behaviour: a cross-sectional analysis of data from Victorian secondary school students. *Australian and New Zealand journal of public health*, *37*(1), 76-82.
- Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical psychology review*, *30*(2), 217-237.
- Allamani, Beccaria, & Voller (2010). The puzzle of Italian drinking. *Nordic Studies on Alcohol and Drugs*, *27*(5), 465-478.
- Allen, K. L., Byrne, S. M., Oddy, W. H., & Crosby, R. D. (2013). Early onset binge eating and purging eating disorders: Course and outcome in a population-based study of adolescents. *Journal of abnormal child psychology*, *41*(7), 1083-1096.
- Alvarenga, M. S., Negrão, A. B., & Philippi, S. T. (2003). Nutritional aspects of eating episodes followed by vomiting in Brazilian patients with bulimia nervosa. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *8*(2), 150-156.
- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders*, (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Arnow, B., Kenardy, J., & Agras, W. S. (1992). Binge eating among the obese: A descriptive study. *Journal of behavioral medicine*, *15*(2), 155-170.
- Babiaz, S., Ward, R. M., & Brinkman, C. (2013). Examination of Drunkorexia, Excessive Exercising, and Extreme Drinking. *Journal of Young Investigators*, *25*(4), 52-56.
- Babor, T. F., De La Fuente, J. R., Saunders, J., & Grant, M. (1992). Audit. *The Alcohol Use Disorders Identification Test. Guidelines for Use in Primary Health Care*. Geneva, Switzerland: World Health Organization.
- Barry, A. E., & Piazza-Gardner, A. K. (2012). Drunkorexia: understanding the co-occurrence of alcohol consumption and eating/exercise weight management behaviors. *Journal of American College Health*, *60*(3), 236-243.

- Barry, A. E., Whiteman, S., Piazza-Gardner, A. K., & Jensen, A. C. (2013). Gender differences in the associations among body mass index, weight loss, exercise, and drinking among college students. *Journal of American College Health, 61*(7), 407-413.
- Bartholome, L. T., Raymond, N. C., Lee, S. S., Peterson, C. B., & Warren, C. S. (2006). Detailed analysis of binges in obese women with binge eating disorder: Comparisons using multiple methods of data collection. *International Journal of Eating Disorders, 39*(8), 685-693.
- Bartholow, B. D., Pearson, M., Sher, K. J., Wieman, L. C., Fabiani, M., & Gratton, G. (2003). Effects of alcohol consumption and alcohol susceptibility on cognition: a psychophysiological examination. *Biological psychology, 64*(1), 167-190.
- Beccaria, F., & Prina, F. (2010). Young people and alcohol in Italy: An evolving relationship. *Drugs: education, prevention and policy, 17*(2), 99-122.
- Benjamin, L., & Wulfert, E. (2005). Dispositional correlates of addictive behaviors in college women: Binge eating and heavy drinking. *Eating Behaviors, 6*(3), 197-209.
- Berking, M., Margraf, M., Ebert, D., Wupperman, P., Hofmann, S. G., & Junghanns, K. (2011). Deficits in emotion-regulation skills predict alcohol use during and after cognitive-behavioral therapy for alcohol dependence. *Journal of consulting and clinical psychology, 79*(3), 307.
- Biolcati, R., Passini, S., & Mancini, G. (2016). "I cannot stand the boredom." Binge drinking expectancies in adolescence. *Addictive Behaviors Reports, 3*, 70-76.
- Boggiano, M. M., Burgess, E. E., Turan, B., Soleymani, T., Daniel, S., Vinson, L. D., ... & Morse, A. (2014). Motives for eating tasty foods associated with binge-eating. Results from a student and a weight-loss seeking population. *Appetite, 83*, 160-166.
- Bolton, J., Cox, B., Clara, I., & Sareen, J. (2006). Use of alcohol and drugs to self-medicate anxiety disorders in a nationally representative sample. *The Journal of nervous and mental disease, 194*(11), 818-825.
- Boone, L. (2013). Are attachment styles differentially related to interpersonal perfectionism and binge eating symptoms?. *Personality and individual differences, 54*(8), 931-935.
- Boone, L., Soenens, B., Mouratidis, A., Vansteenkiste, M., Verstuyf, J., & Braet, C. (2012). Daily fluctuations in perfectionism dimensions and their relation to eating disorder symptoms. *Journal of Research in Personality, 46*(6), 678-687.
- Borsari, B., & Carey, K. B. (2001). Peer influences on college drinking: a review of the research. *Journal of Substance Abuse, 13*(4), 391-424.
- Brockmeyer, T., Bents, H., Holtforth, M. G., Pfeiffer, N., Herzog, W., & Friederich, H. C. (2012). Specific emotion regulation impairments in major depression and anorexia nervosa. *Psychiatry research, 200*(2), 550-553.

- Bryant, J. B., Darkes, J., & Rahal, C. (2012). College students' compensatory eating and behaviors in response to alcohol consumption. *Journal of American College Health, 60*(5), 350-356.
- Bulik, C. M., Klump, K. L., Thornton, L., Kaplan, A. S., Devlin, B., Fichter, M. M., ... & Crow, S. (2004). Alcohol Use Disorder Comorbidity in Eating Disorders: A Multicenter Study.[CME]. *The Journal of clinical psychiatry, 65*(7), 1000-1006.
- Burke, S. C., Cremeens, J., Vail-Smith, K., & Woolsey, C. (2010). Drunkorexia: calorie restriction prior to alcohol consumption among college freshman. *Journal of alcohol and drug education, 54*(2), 17-34.
- Buu, A., Dabrowska, A., Mygrants, M., Puttler, L. I., Jester, J. M., & Zucker, R. A. (2014). Gender differences in the developmental risk of onset of alcohol, nicotine, and marijuana use and the effects of nicotine and marijuana use on alcohol outcomes. *Journal of studies on alcohol and drugs, 75*(5), 850-858.
- Carey, K. B. (2001). Understanding binge drinking: introduction to the special issue. *Psychology of Addictive Behaviors, 15*(4), 283-286.
- Carlson, S. R., Johnson, S. C., & Jacobs, P. C. (2010). Disinhibited characteristics and binge drinking among university student drinkers. *Addictive behaviors, 35*(3), 242-251.
- Carrus, G., Panno, A., Deiana, L., Crano, W. D., Fiorentino, D., Ceccanti, M., ... & Giuliani, A. (2016). Group Membership and Adolescents' Alcohol Intake: The Role of Drinking Motives. *Journal of studies on alcohol and drugs, 77*(1), 143-149.
- Cassin, S. E., & von Ranson, K. M. (2005). Personality and eating disorders: a decade in review. *Clinical psychology review, 25*(7), 895-916.
- Cassin, S. E., & von Ranson, K. M. (2007). Is binge eating experienced as an addiction? *Appetite, 49*(3), 687-690.
- CBS News (2008). Drunkorexia: Health dangers for women. Retrieved from <http://www.sbsnews.com/stories/2008/01/23/entertainment/main3744289.shtml>
- Chambers, R. A. (2008). Drunkorexia. *Journal of Dual Diagnosis, 4*(4), 414-416.
- Chassin, L., Pitts, S. C., & Prost, J. (2002). Binge drinking trajectories from adolescence to emerging adulthood in a high-risk sample: predictors and substance abuse outcomes. *Journal of consulting and clinical psychology, 70*(1), 67-78.
- Christiansen, M., Vik, P. W., & Jarchow, A. (2002). College student heavy drinking in social contexts versus alone. *Addictive Behaviors, 27*(3), 393-404.
- Coakes, S. J. (2005). *SPSS version 12.0 for windows: Analysis without anguish*. Queensland, Australia: Wiley.

- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohn, L. D., Macfarlane, S., Yanez, C., & Imai, W. K. (1995). Risk-perception: differences between adolescents and adults. *Health Psychology, 14*(3), 217.
- Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child development, 75*(2), 317-333.
- Cole, P. M., Michel, M. K., & Teti, L. O. D. (1994). The development of emotion regulation and dysregulation: A clinical perspective. *Monographs of the society for research in child development, 59*(2-3), 73-102.
- Connolly, A. M., Rieger, E., & Caterson, I. (2007). Binge eating tendencies and anger coping: Investigating the confound of trait neuroticism in a non-clinical sample. *European Eating Disorders Review, 15*(6), 479-486.
- Cooper, M. L. (1994). Motivations for alcohol use among adolescents: Development and validation of a four-factor model. *Psychological assessment, 6*(2), 117-128.
- Cooper, M. L., Agocha, V. B., & Sheldon, M. S. (2000). A motivational perspective on risky behaviors: The role of personality and affect regulatory processes. *Journal of personality, 68*(6), 1059-1088.
- Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: a motivational model of alcohol use. *Journal of personality and social psychology, 69*(5), 990-1005.
- Cooper, M. L., Russell, M., Skinner, J. B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological assessment, 4*(2), 123-132.
- Corstorphine, E., Waller, G., Ohanian, V., & Baker, M. (2006). Changes in internal states across the binge-vomit cycle in bulimia nervosa. *The Journal of nervous and mental disease, 194*(6), 446-449.
- Courtney, K. E., & Polich, J. (2009). Binge drinking in young adults: Data, definitions, and determinants. *Psychological bulletin, 135*(1), 142-156.
- Cox, W. M., & Klinger, E. (1988). A motivational model of alcohol use. *Journal of abnormal psychology, 97*(2), 168-180.
- Cox, W. M., & Klinger, E. (1990). Incentive motivation, affective change, and alcohol use: A model. In M. Cox (Ed.), *Why people drink: Parameters of alcohol as a reinforcer*, (pp. 291-314). New York: Gardenr Press.

- Crandall, C. S. (1998). Social contagion of binge eating. *Journal of Personality and Social Psychology*, 55(4), 588-598.
- Czaja, J., Rief, W., & Hilbert, A. (2009). Emotion regulation and binge eating in children. *International Journal of Eating Disorders*, 42(4), 356-362.
- D'Alessio, M., Baiocco, R., & Laghi, F. (2006). The problem of binge drinking among Italian university students: a preliminary investigation. *Addictive behaviors*, 31(12), 2328-2333.
- Dalle Grave, R., Calugi, S., Corica, F., Di Domizio, S., Marchesini, G. (2009). Psychological variables associated with weight loss in obese patients seeking treatment at medical centers. *Journal of the American Dietetic Association*, 109(12), 2010-2016.
- Dalle Grave, R., Calugi, S., Petroni, M. L., Di Domizio, S., Marchesini, G. (2010). Weight management, psychological distress and binge eating in obesity. A reappraisal of the problem. *Appetite*, 54(2), 269-273.
- Davis, R., & Jamieson, J. (2005). Assessing the functional nature of binge eating in the eating disorders. *Eating behaviors*, 6(4), 345-354.
- Dawe, S., & Loxton, N. J. (2004). The role of impulsivity in the development of substance use and eating disorders. *Neuroscience & Biobehavioral Reviews*, 28(3), 343-351.
- Degner, A. J. (2006). The definition of adolescence: One term fails to adequately define this diverse time period. *CHARIS: A Journal of Lutheran Scholarship, Thought, and Opinion*, 5(3), 7-8.
- Dragan, M. (2015). Difficulties in emotion regulation and problem drinking in young women: The mediating effect of metacognitions about alcohol use. *Addictive behaviors*, 48, 30-35.
- Dvorak, R. D., Sargent, E. M., Kilwein, T. M., Stevenson, B. L., Kuvaas, N. J., & Williams, T. J. (2014). Alcohol use and alcohol-related consequences: associations with emotion regulation difficulties. *The American Journal of Drug and Alcohol Abuse*, 40(2), 125-130.
- Eisenberg, M. H., & Fitz, C. C. (2014). "Drunkorexia": Exploring the Who and Why of a Disturbing Trend in College Students' Eating and Drinking Behaviors. *Journal of American College Health*, 62(8), 570-577.
- Else-Quest, N. M., Hyde, J. S., Goldsmith, H. H., & Van Hulle, C. A. (2006). Gender differences in temperament: a meta-analysis. *Psychological bulletin*, 132(1), 33-72.
- Engelberg, M. J., Steiger, H., Gauvin, L., & Wonderlich, S. A. (2007). Binge antecedents in bulimic syndromes: an examination of dissociation and negative affect. *International Journal of Eating Disorders*, 40(6), 531-536.
- Engels, R. C., Wiers, R., Lemmers, L. E. X., & Overbeek, G. (2005). Drinking motives, alcohol expectancies, self-efficacy, and drinking patterns. *Journal of drug education*, 35(2), 147-166.

- Esser, M. B., Kanny, D., Brewer, R. D., & Naimi, T. S. (2012). Binge drinking intensity: a comparison of two measures. *American journal of preventive medicine*, 42(6), 625-629.
- European School Survey Projection on Alcohol and Other Drugs (2015). Retrieved from [http://www.espad.org/sites/espad.org/files/ESPAD\\_report\\_2015.pdf](http://www.espad.org/sites/espad.org/files/ESPAD_report_2015.pdf)
- Fairburn C. G. & Cooper P. (1989). Eating disorders. In K. Hawton, P. M. Salkovskis, J. Kirk & D. M. Clark (Eds.), *Cognitive behaviour therapy for psychiatric problems* (pp. 227-314). New York: Oxford University Press.
- Ferriter, C., & Ray, L. A. (2011). Binge eating and binge drinking: An integrative review. *Eating behaviors*, 12(2), 99-107.
- Fillmore, M. T., & Jude, R. (2011). Defining “binge” drinking as five drinks per occasion or drinking to a .08% BAC: which is more sensitive to risk?. *The American Journal on Addictions*, 20(5), 468-475.
- Fischer, J. L., Forthun, L. F., Pidcock, B. W., & Dowd, D. A. (2007). Parent relationships, emotion regulation, psychosocial maturity and college student alcohol use problems. *Journal of Youth and Adolescence*, 36(7), 912-926.
- Fischer, S., Anderson, K. G., & Smith, G. T. (2004). Coping with distress by eating or drinking: role of trait urgency and expectancies. *Psychology of Addictive Behaviors*, 18(3), 269-274.
- Fischer, S., Smith, G. T., & Cyders, M. A. (2008). Another look at impulsivity: a meta-analytic review comparing specific dispositions to rash action in their relationship to bulimic symptoms. *Clinical Psychology Review*, 28(8), 1413-1425.
- Fischer, S., Smith, G. T., Annus, A., & Hendricks, M. (2007). The relationship of neuroticism and urgency to negative consequences of alcohol use in women with bulimic symptoms. *Personality and Individual Differences*, 43(5), 1199-1209.
- Fossati, A., Gratz, K. L., Maffei, C., & Borroni, S. (2014). Impulsivity dimensions, emotion dysregulation, and borderline personality disorder features among Italian nonclinical adolescents. *Borderline personality disorder and emotion dysregulation*, 1(1), 1-11.
- Gadalla, T., & Piran, N. (2007). Co-occurrence of eating disorders and alcohol use disorders in women: a meta analysis. *Archives of Women's Mental Health*, 10(4), 133-140.
- Garner, D. M. (2004). *The Eating Disorder Inventory-3: Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Garofalo, C., Holden, C. J., Zeigler-Hill, V., & Velotti, P. (2016). Understanding the connection between self-esteem and aggression: The mediating role of emotion dysregulation. *Aggressive behavior*, 42(1), 3-15.

- Gianini, L. M., White, M. A., & Masheb, R. M. (2013). Eating pathology, emotion regulation, and emotional overeating in obese adults with binge eating disorder. *Eating behaviors, 14*(3), 309-313.
- Giannini, M., Pannicchia, L., Dalle Grave, R., Muratori, F., & Viglione, V. (eds.). (2008). *EDI-3. Eating Disorder Inventory -3*. Manuale, Firenze: Organizzazioni Speciali.
- Gilboa-Schechtman, E., Avnon, L., Zubery, E., & Jeczmierny, P. (2006). Emotional processing in eating disorders: specific impairment or general distress related deficiency? *Depression and anxiety, 23*(6), 331-339.
- 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, 57*(6), 603-610.
- Giromini, L., Velotti, P., de Campora, G., Bonalume, L., & Cesare Zavattini, G. (2012). Cultural adaptation of the difficulties in emotion regulation scale: Reliability and validity of an Italian version. *Journal of Clinical Psychology, 68*(9), 989-1007.
- Glindemann, K.E., Geller, E.S., & Fortney, J.N. (1999). Self-esteem and alcohol consumption: A study of college drinking behavior in a naturalistic setting. *Journal of Alcohol and Drug Education, 45*(1), 60-71.
- Godart, N. T., Perdereau, F., Rein, Z., Berthoz, S., Wallier, J., Jeammet, P., & Flament, M. F. (2007). Comorbidity studies of eating disorders and mood disorders. Critical review of the literature. *Journal of Affective Disorders, 97*(1-3), 37-49.
- Gonzalez, V. M., Collins, R. L., & Bradizza, C. M. (2009). Solitary and social heavy drinking, suicidal ideation, and drinking motives in underage college drinkers. *Addictive Behaviors, 34*(12), 993-999.
- Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive behaviors, 7*(1), 47-55.
- Goudriaan, A. E., Grekin, E. R., & Sher, K. J. (2007). Decision making and binge drinking: a longitudinal study. *Alcoholism, Clinical and Experimental Research, 31*(6), 928-938.
- Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of psychopathology and behavioral assessment, 26*(1), 41-54.
- Graziano, F., Bina, M., Giannotta, F., & Ciairano, S. (2012). Drinking motives and alcoholic beverage preferences among Italian adolescents. *Journal of adolescence, 35*(4), 823-831.

- Greene, K., Krmar, M., Walters, L. H., Rubin, D. L., & Hale, L. (2000). Targeting adolescent risk-taking behaviors: the contributions of egocentrism and sensation-seeking. *Journal of adolescence*, 23(4), 439-461.
- Greeno, C. G., Wing, R. R., & Shiffman, S. (2000). Binge antecedents in obese women with and without binge eating disorder. *Journal of Consulting and Clinical Psychology*, 68(1), 95-102.
- Greenwood, J., Broadbent, J., & Fuller-Tyszkiewicz, M. (2014). Restrained eaters consume more food only if they are impulsive and male. *Eating behaviors*, 15(4), 582-585.
- Grilo, C. M., Shiffman, S., & Carter-Campbell, J. T. (1994). Binge eating antecedents in normal-weight nonpurging females: is there consistency?. *International Journal of Eating Disorders*, 16(3), 239-249.
- Gross, J. J., & Thompson, R. A. (2007). Emotion regulation: Conceptual foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–26). New York: Guilford.
- Guss, J. L., Kissileff, H. R., Devlin, M. J., Zimmerli, E., Walsh, B. T. (2002). Binge size increases with body mass index in women with binge eating disorder. *Obesity Research*, 10, 1021-1029.
- Haddock, C. K., & Dill, P. L. (1999). The effects of food on mood and behavior: Implications for the addictions model of obesity and eating disorders. *Drugs & Society*, 15, 17-47.
- Haedt-Matt, A. A., & Keel, P. K. (2011). Revisiting the affect regulation model of binge eating: a meta-analysis of studies using ecological momentary assessment. *Psychological bulletin*, 137(4), 660-681.
- Ham, L. S., & Hope, D. A. (2003). College students and problematic drinking: A review of the literature. *Clinical psychology review*, 23(5), 719-759.
- Harrison, A., Sullivan, S., Tchanturia, K., & Treasure, J. (2009). Emotion recognition and regulation in anorexia nervosa. *Clinical psychology & psychotherapy*, 16(4), 348-356.
- Harrison, A., Sullivan, S., Tchanturia, K., & Treasure, J. (2010). Emotional functioning in eating disorders: attentional bias, emotion recognition and emotion regulation. *Psychological medicine*, 40(11), 1887-1897.
- Havighurst, R. J. (1952). *Developmental Task and Education*. New York: Davis McKay.
- Havighurst, R. J. (1953) *Human Development and Education*. New York: Longman.
- Hawks, S. R., Merrill, C. G., Gast, J. A., & Hawks, J. F. (2004). Validation of the motivation for eating scale. *Ecology of food and nutrition*, 43(4), 307-326.
- Heatherton, T. F., & Baumeister, R. F. (1991). Binge eating as escape from self-awareness. *Psychological bulletin*, 110(1), 86-108.

- Herman, C. P., & Polivy, J. (2004). The self-regulation of eating: Theoretical and practical problems. In R. F. Baumeister, K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 492-508). New York: Guilford Press.
- Hetherington, M. M., Spalter, A. R., Bernat, A. S., Nelson, M. L., & Gold, P. W. (1993). Eating pathology in bulimia nervosa. *International Journal of Eating Disorders, 13*(1), 13-24.
- Hilbert, A., & Tuschen-Caffier, B. (2007). Maintenance of binge eating through negative mood: A naturalistic comparison of binge eating disorder and bulimia nervosa. *International Journal of Eating Disorders, 40*(6), 521-530.
- Holderness, C. C., Brooks-Gunn, J., & Warren, M. P. (1994). Co-morbidity of eating disorders and substance abuse review of the literature. *International Journal of Eating Disorders, 16*(1), 1-34.
- Hsu, L. K. G. (1990) Experiential aspects of bulimia nervosa: Implications for cognitive behavioral therapy. *Behavior Modification, 14*, 50-65.
- Hunt, T. K., & Forbush, K. T. (2016). Is “drunkorexia” an eating disorder, substance use disorder, or both? *Eating behaviors, 22*, 40-45.
- Jaccard, J., & Turrissi, R. (1987). Cognitive processes and individual differences in judgments relevant to drunk driving. *Journal of personality and social psychology, 53*(1), 133-145.
- Jackson, B., Cooper, M. L., Mintz, L., & Albino, A. (2003). Motivations to eat: Scale development and validation. *Journal of Research in Personality, 37*(4), 297-318.
- Jackson, K. M. (2008). Heavy episodic drinking: Determining the predictive utility of five or more drinks. *Psychology of Addictive Behaviors, 22*(1), 68-77.
- Jessor, R. (1991). Risk behavior in adolescence: A psychosocial framework for understanding and action. *Journal of adolescent Health, 12*(8), 597-605.
- Johnson, C., & Larson, R. (1982). Bulimia: an analysis of moods and behavior. *Psychosomatic Medicine, 44*(4), 341-351.
- Kairouz, S., Gliksman, L., Demers, A., & Adlaf, E. M. (2002). For all these reasons, I do... drink: a multilevel analysis of contextual reasons for drinking among Canadian undergraduates. *Journal of studies on alcohol, 63*(5), 600-608.
- Kane, T. A., Loxton, N. J., Staiger, P. K., & Dawe, S. (2004). Does the tendency to act impulsively underlie binge eating and alcohol use problems? An empirical investigation. *Personality and individual differences, 36*(1), 83-94.
- Kaplan, P. S. (2004). *Adolescence*. Boston: Houghton Mifflin Company.
- Kelly-Weeder, S. (2011). Binge drinking and disordered eating in college students. *Journal of the American Academy of Nurse Practitioners, 23*(1), 33-41.

- Khaylis, A., Trockel, M., & Taylor, C. B. (2009). Binge drinking in women at risk for developing eating disorders. *International Journal of Eating Disorders*, *42*(5), 409-414.
- Kjelsås, E., Børsting, I., & Gudde, C. B. (2004). Antecedents and consequences of binge eating episodes in women with an eating disorder. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity*, *9*(1), 7-15.
- Knight, L. J., & Boland, F. J. (1989). Restrained eating: an experimental disentanglement of the disinhibiting variables of perceived calories and food type. *Journal of abnormal psychology*, *98*(4), 412-420.
- Krahn, D., Kurth, C., Demitrack, M., & Drewnowski, A. (1992). The relationship of dieting severity and bulimic behaviors to alcohol and other drug use in young women. *Journal of Substance Abuse*, *4*(4), 341-353.
- Kuntsche, E., & Cooper, M. L. (2010). Drinking to have fun and to get drunk: Motives as predictors of weekend drinking over and above usual drinking habits. *Drug and alcohol dependence*, *110*(3), 259-262.
- Kuntsche, E., & Kuntsche, S. (2009). Development and validation of the drinking motive questionnaire revised short form (DMQ-R SF). *Journal of Clinical Child & Adolescent Psychology*, *38*(6), 899-908.
- Kuntsche, E., & Labhart, F. (2013). Drinking motives moderate the impact of pre-drinking on heavy drinking on a given evening and related adverse consequences-An event-level study. *Addiction*, *108*(10), 1747-1755.
- Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2005). Why do young people drink? A review of drinking motives. *Clinical psychology review*, *25*(7), 841-861.
- Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2006). Who drinks and why? A review of socio-demographic, personality, and contextual issues behind the drinking motives in young people. *Addictive behaviors*, *31*(10), 1844-1857.
- Kuntsche, E., Rehm, J., & Gmel, G. (2004). Characteristics of binge drinkers in Europe. *Social science & medicine*, *59*(1), 113-127.
- Kuntsche, E., von Fischer, M., & Gmel, G. (2008). Personality factors and alcohol use: A mediator analysis of drinking motives. *Personality and Individual Differences*, *45*(8), 796-800.
- Lafrance Robinson, A., Kosmerly, S., Mansfield-Green, S., & Lafrance, G. (2014). Disordered eating behaviours in an undergraduate sample: Associations among gender, body mass index, and difficulties in emotion regulation. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, *46*(3), 320-326.

- Laghi, F., Baiocco, R., Liga, F., Lonigro, A., & Baumgartner, E. (2014). Binge eating and binge drinking behaviors: individual differences in adolescents' identity styles. *Journal of Health Psychology, 19*(3), 333-343.
- Laghi, F., Baumgartner, E., Baiocco, R., Kotzalidis, G. D., Piacentino, D., Girardi, P., & Angeletti, G. (2016). Alcohol intake and binge drinking among Italian adolescents: The role of drinking motives. *Journal of addictive diseases, 35*(2), 119-127.
- Laghi, F., Liga, F., Baumgartner, E., & Baiocco, R. (2012a). Time perspective and psychosocial positive functioning among Italian adolescents who binge eat and drink. *Journal of adolescence, 35*(5), 1277-1284.
- Laghi, F., Liga, F., Baumgartner, E., & Baiocco, R. (2012b). Identity and conformism among Italian adolescents who binge eat and drink. *Health, risk & society, 14*(4), 361-376.
- Laghi, F., Pompili, S., Baumgartner, E., & Baiocco, R. (2015). The role of sensation seeking and motivations for eating in female and male adolescents who binge eat. *Eating behaviors, 17*, 119-124.
- Lai, C. M., Mak, K. K., Pang, J. S., Fong, S. S., Ho, R. C., & Guldan, G. S. (2013). The associations of sociocultural attitudes towards appearance with body dissatisfaction and eating behaviors in Hong Kong adolescents. *Eating behaviors, 14*(3), 320-324.
- Lange, J. E., & Voas, R. B. (2001). Defining binge drinking quantities through resulting blood alcohol concentrations. *Psychology of Addictive Behaviors, 15*(4), 310-316.
- Lavender, J. M., & Anderson, D. A. (2010). Contribution of emotion regulation difficulties to disordered eating and body dissatisfaction in college men. *International Journal of Eating Disorders, 43*(4), 352-357.
- León, J. C., Carmona, J., & García, P. (2010). Health-risk behaviors in adolescents as indicators of unconventional lifestyles. *Journal of adolescence, 33*(5), 663-671.
- Lingswiler, V. M., Crowther, J. H., & Stephens, M. A. P. (1989a). Affective and cognitive antecedents to eating episodes in bulimia and binge eating. *International Journal of Eating Disorders, 8*(5), 533-539.
- Lingswiler, V. M., Crowther, J. H., & Stephens, M. A. P. (1989b). Emotional and somatic consequences of binge episodes. *Addictive behaviors, 14*(5), 503-511.
- Loxton, N. J., & Dawe, S. (2001). Alcohol abuse and dysfunctional eating in adolescent girls: The influence of individual differences in sensitivity to reward and punishment. *International Journal of Eating Disorders, 29*(4), 455-462.
- Luce, K. H., Crowther, J. H., Leahey, T., & Buchholz, L. J. (2013). Do restrained eaters restrict their caloric intake prior to drinking alcohol? *Eating behaviors, 14*(3), 361-365.

- Luce, K. H., Engler, P. A., & Crowther, J. H. (2007). Eating disorders and alcohol use: group differences in consumption rates and drinking motives. *Eating Behaviors*, 8(2), 177-184.
- Luhtanen, R. K., & Crocker, J. (2005). Alcohol use in college students: effects of level of self-esteem, narcissism, and contingencies of self-worth. *Psychology of Addictive Behaviors*, 19(1), 99–103.
- Lupi, M., Acciavatti, T., Santacroce, R., Cinosi, E., Martinotti, G., & Di Giannantonio, M. (2014). “Drunkorexia”: a pilot study in an Italian sample”. *Research and Advances in Psychiatry*, 1(1), 1-5.
- Lynch, W. C., Everingham, A., Dubitzky, J., Hartman, M., & Kasser, T. (2000). Does binge eating play a role in the self-regulation of moods?. *Integrative Physiological and Behavioral Science*, 35(4), 298-313.
- Lyvers, M., Hasking, P., Hani, R., Rhodes, M., & Trew, E. (2010). Drinking motives, drinking restraint and drinking behaviour among young adults. *Addictive behaviors*, 35(2), 116-122.
- Mannucci, E., Petroni, M. L., Villanova, N., Rotella, C. M., Apolone, G., & Marchesini, G. (2010). Clinical and psychological correlates of health-related quality of life in obese patients. *Health and quality of life outcomes*, 8(1), 1-9.
- Markey, M. A., & Vander Wal, J. S. (2007). The role of emotional intelligence and negative affect in bulimic symptomatology. *Comprehensive psychiatry*, 48(5), 458-464.
- Mauler, B. I., Hamm, A. O., Weike, A. I., & Tuschen-Caffier, B. (2006). Affect regulation and food intake in bulimia nervosa: Emotional responding to food cues after deprivation and subsequent eating. *Journal of Abnormal Psychology*, 115(3), 567-579.
- Mazzardis, S., Vieno, A., Kuntsche, E., & Santinello, M. (2010). Italian validation of the drinking motives questionnaire revised short form (DMQ-R SF). *Addictive behaviors*, 35(10), 905-908.
- McBride, N. M., Barrett, B., Moore, K. A., & Schonfeld, L. (2014). The role of positive alcohol expectancies in underage binge drinking among college students. *Journal of American College Health*, 62(6), 370-379.
- McGinnis, J. M., & Foege, W. H. (1993). Actual causes of death in the United States. *Jama*, 270(18), 2207-2212.
- McManus, F., & Waller, G. (1995). A functional analysis of binge-eating. *Clinical psychology review*, 15(8), 845-863.
- Measelle, J. R., Stice, E., & Hogansen, J. M. (2006). Developmental trajectories of co-occurring depressive, eating, antisocial, and substance abuse problems in female adolescents. *Journal of abnormal psychology*, 115(3), 524-538.
- Miller, J. W., Naimi, T. S., Brewer, R. D., & Jones, S. E. (2007). Binge drinking and associated health risk behaviors among high school students. *Pediatrics*, 119(1), 76-85.

- Mitchell, J. E., Hatsukami, D., Eckert, E. D., & Pyle, R. L. (1985). Characteristics of 275 patients with bulimia. *The American Journal of Psychiatry*, *142*(4), 482-485.
- Mitchell, J. E., Mussell, M. P., Peterson, C. B., Crow, S., Wonderlich, S. A., Crosby, R. D., ... & Weller, C. (1999). Hedonics of binge eating in women with bulimia nervosa and binge eating disorder. *International Journal of Eating Disorders*, *26*(2), 165-170.
- Moss, A. C., & Albery, I. P. (2009). A dual-process model of the alcohol-behavior link for social drinking. *Psychological Bulletin*, *135*(4), 516-530.
- Muehlenkamp, J. J., Peat, C. M., Claes, L., & Smits, D. (2012). Self-injury and disordered eating: Expressing emotion dysregulation through the body. *Suicide and Life-Threatening Behavior*, *42*(4), 416-425.
- Munsch, S., Meyer, A. H., Quartier, V., & Wilhelm, F. H. (2012). Binge eating in binge eating disorder: a breakdown of emotion regulatory process? *Psychiatry research*, *195*(3), 118-124.
- Murphy, J.G., McDevitt-Murphy, M.E., Barnett, N.P. (2005). Drink and Be Merry? Gender, Life Satisfaction, and Alcohol Consumption Among College Students. *Psychology of Addictive Behaviors*, *19*(2), 184-191.
- Nandrino, J. L., Doba, K., Lesne, A., Christophe, V., & Pezard, L. (2006). Autobiographical memory deficit in anorexia nervosa: Emotion regulation and effect of duration of illness. *Journal of Psychosomatic Research*, *61*(4), 537-543.
- National Institute on Alcohol Abuse and Alcoholism (2004). *NIAAA Council approves definition of binge drinking*, *NIAAA Newsletter*, No. 3. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism.
- Nelson, M. C., Lust, K., Story, M., & Ehlinger, E. (2009). Alcohol use, eating patterns, and weight behaviors in a university population. *American journal of health behavior*, *33*(3), 227-237.
- Németh, Z., Urbán, R., Kuntsche, E., San Pedro, E. M., Nieto, J. G. R., Farkas, J., ... & Demetrovics, Z. (2011). Drinking motives among Spanish and Hungarian young adults: a cross-national study. *Alcohol and alcoholism*, *46*(3), 261-269.
- Neumark-Sztainer, D., & Story, M. (1998). Dieting and binge eating among adolescents: what do they really mean?. *Journal of the American Dietetic Association*, *98*(4), 446-450.
- Neumark-Sztainer, D., Wall, M., Larson, N. I., Eisenberg, M. E., & Loth, K. (2011). Dieting and disordered eating behaviors from adolescence to young adulthood: findings from a 10-year longitudinal study. *Journal of the American Dietetic Association*, *111*(7), 1004-1011.
- Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: The role of gender. *Annual review of clinical psychology*, *8*, 161-187.

- Oei, T. P., & Morawska, A. (2004). A cognitive model of binge drinking: The influence of alcohol expectancies and drinking refusal self-efficacy. *Addictive behaviors, 29*(1), 159-179.
- Parra, G. R., Krull, J. L., Sher, K. J., & Jackson, K.M. (2007). Frequency of heavy drinking and perceived peer alcohol involvement: Comparison of influence and selection mechanisms from a development perspective. *Addictive Behaviors, 32*(10), 2211-2225.
- Paulus, D. J., Bakhshaie, J., Lemaire, C., Garza, M., Ochoa-Perez, M., Valdivieso, J., ... & Neighbors, C. (2016). Negative affectivity and problematic alcohol use among latinos in primary care: The role of emotion dysregulation. *Journal of dual diagnosis, 12*(2), 127-137.
- Peirce, R. S., Frone, M. R., Russell, M., & Cooper, M. L. (1996). Financial stress, social support, and alcohol involvement: a longitudinal test of the buffering hypothesis in a general population survey. *Health Psychology, 15*(1), 38-47.
- Peralta, R. L. (2002). Alcohol use and the fear of weight gain in college: Reconciling two social norms. *Gender Issues, 20*(4), 23-42.
- Petit, G., Luminet, O., Maurage, F., Tecco, J., Lechantre, S., Ferauge, M., ... & Timary, P. (2015). Emotion regulation in alcohol dependence. *Alcoholism: Clinical and Experimental Research, 39*(12), 2471-2479.
- Piazza-Gardner, A. K., & Barry, A. E. (2013). Appropriate terminology for the alcohol, eating, and physical activity relationship. *Journal of American College Health, 61*(5), 311-313.
- Piccinelli, M., Tessari, E., Bortolomasi, M., Piasere, O., Semenzin, M., Garzotto, N., & Tansella, M. (1997). Efficacy of the alcohol use disorders identification test as a screening tool for hazardous alcohol intake and related disorders in primary care: a validity study. *Bmj, 314*(7078), 420-424.
- Piran, N., & Robinson, S. R. (2011). Patterns of associations between eating disordered behaviors and substance use in two non-clinical samples: a university and a community based sample. *Journal of health psychology, 16*(7), 1027-1037.
- Polivy, J., & Herman, C. P. (1985). Dieting and bingeing: A causal analysis. *American Psychologist, 40*(2), 193-201.
- Polivy, J., & Herman, C. P. (1993). Etiology of binge eating: Psychological mechanisms. In C. G. Fairburn & G. T. Wilson (Eds.), *Binge eating: Naturem, assessment and treatment* (pp. 173-205). New York: Guilford Press.
- Powell, A. L., & Thelen, M. H. (1996). Emotions and cognitions associated with bingeing and weight control behavior in bulimia. *Journal of psychosomatic research, 40*(3), 317-328.
- Reifman, A., Watson, W. K., & McCourt, A. (2006). Social networks and college drinking: Probing processes of social influence and selection. *Personality and Social Psychology Bulletin, 32*(6), 820-832.

- Ricca, V., Castellini, G., Fioravanti, G., Lo Sauro, C., Rotella, F., Ravaldi, C., ... & Faravelli, C. (2012). Emotional eating in anorexia nervosa and bulimia nervosa. *Comprehensive psychiatry*, 53(3), 245-251.
- Ricca, V., Castellini, G., Lo Sauro, C., Ravaldi, C., Lapi, F., Mannucci, E., ... & Faravelli, C. (2009). Correlations between binge eating and emotional eating in a sample of overweight subjects. *Appetite*, 53(3), 418-421.
- Ricca, V., Mannucci, E., Moretti, S., Di Bernardo, M., Zucchi, T., Cabras, P. L., & Rotella, C. M. (2000). Screening for binge eating disorder in obese outpatients. *Comprehensive psychiatry*, 41(2), 111-115.
- Ricciardelli, L. A., Williams, R. J., & Finemore, J. (2001). Restraint as misregulation in drinking and eating. *Addictive behaviors*, 26(5), 665-675.
- Ronel, N., & Libman, G. (2003). Eating disorders and recovery: lessons from overeaters anonymous. *Clinical Social Work Journal*, 31(2), 155-171.
- Roosen, K. M., & Mills, J. S. (2015). Exploring the motives and mental health correlates of intentional food restriction prior to alcohol use in university students. *Journal of health psychology*, 20(6), 875-886.
- Root, T. L., Pisetsky, E. M., Thornton, L., Lichtenstein, P., Pedersen, N. L., & Bulik, C. M. (2010). Patterns of co-morbidity of eating disorders and substance use in Swedish females. *Psychological medicine*, 40(01), 105-115.
- Rush, C. C., Becker, S. J., & Curry, J. F. (2009). Personality factors and styles among college students who binge eat and drink. *Psychology of Addictive Behaviors*, 23(1), 140-145.
- Sales, J. M., & Irwin Jr, C. E. (2009). Theories of adolescent risk-taking: A biopsychosocial model. In R. J. DiClemente & R. Crosby (Eds.), *Adolescent health: Understanding and preventing risk behaviors and adverse health outcomes* (pp. 31-50). San Francisco, CA: Jossey-Bass.
- Sales, J. M., & Irwin Jr, C. E. (2013). A Biopsychosocial Perspective of Adolescent Health and Disease. In W. T. O'Donohue, L. T. Benuto, L. W. Tolle, L. Payne, R. Davis (Eds.), *Handbook of Adolescent Health Psychology* (pp. 13-29). New York: Springer.
- Schlundt, D. G., & Johnson, W. G. (1990). *Eating disorders: Assessment and treatment*. Needham Heights, MA, US: Allyn & Bacon.
- Schlundt, D. G., Johnson, W. G., Jarrell, M. P. (1985) A naturalistic functional analysis of eating behavior in bulimia and obesity. *Advances in Behaviour Research & Therapy*, 7, 149-162.
- Schmidt, U. (2000). Binge eating and binge eating disorder. *European Eating Disorders Review*, 8(5), 340-343.

- Segrist, D. J., & Pettibone, J. C. (2009). Where's the bar? Perceptions of heavy and problem drinking among college students. *Journal of Alcohol and Drug Education, 53*(1), 35-53.
- Sim, L., & Zeman, J. (2006). The contribution of emotion regulation to body dissatisfaction and disordered eating in early adolescent girls. *Journal of youth and adolescence, 35*(2), 207-216.
- Siviroj, P., Peltzer, K., Pengpid, S., Yungyen, Y., & Chaichana, A. (2012). Drinking motives, sensation seeking, and alcohol use among Thai high school students. *Social Behavior and Personality: an international journal, 40*(8), 1255-1262.
- Smith, G. T., Simmons, J. R., Flory, K., Annus, A. M., & Hill, K. K. (2007). Thinness and eating expectancies predict subsequent binge-eating and purging behavior among adolescent girls. *Journal of Abnormal Psychology, 116*(1), 188-197.
- Smyth, J. M., Wonderlich, S. A., Heron, K. E., Sliwinski, M. J., Crosby, R. D., Mitchell, J. E., & Engel, S. G. (2007). Daily and momentary mood and stress are associated with binge eating and vomiting in bulimia nervosa patients in the natural environment. *Journal of consulting and clinical psychology, 75*(4), 629-638.
- Sonneville, K. R., Calzo, J. P., Horton, N. J., Haines, J., Austin, S. B., & Field, A. E. (2012). Body satisfaction, weight gain and binge eating among overweight adolescent girls. *International journal of obesity, 36*(7), 944-949.
- Spear, L. P. (2000). The adolescent brain and age-related behavioral manifestations. *Neuroscience & Biobehavioral Reviews, 24*(4), 417-463.
- Steiger, H., Gauvin, L., Engelberg, M. J., Kin, N. N. Y., Israel, M., Wonderlich, S. A., & Richardson, J. (2005). Mood-and restraint-based antecedents to binge episodes in bulimia nervosa: Possible influences of the serotonin system. *Psychological medicine, 35*(11), 1553-1562.
- Stein, R. I., Kenardy, J., Wiseman, C. V., Douchis, J. Z., Arnow, B. A., & Wilfley, D. E. (2007). What's driving the binge in binge eating disorder?: A prospective examination of precursors and consequences. *International Journal of Eating Disorders, 40*(3), 195-203.
- Stewart, S. H., Angelopoulos, M., Baker, J. M., & Boland, F. J. (2000). Relations between dietary restraint and patterns of alcohol use in young adult women. *Psychology of Addictive Behaviors, 14*(1), 77-82.
- Stice, E., Presnell, K., & Spangler, D. (2002). Risk factors for binge eating onset in adolescent girls: a 2-year prospective investigation. *Health Psychology, 21*(2), 131-138.
- Stickney, M. I., Miltenberger, R. G., & Wolff, G. (1999). A descriptive analysis of factors contributing to binge eating. *Journal of Behavior Therapy and Experimental Psychiatry, 30*(3), 177-189.
- Storm, T., & Cutler, R. E. (1981). Observations of drinking in natural settings: Vancouver beer parlors and cocktail lounges. *Journal of studies on Alcohol, 42*(11), 972-997.

- Striegel-Moore, R. H., & Franko, D. L. (2008). Should binge eating disorder be included in the DSM-V? A critical review of the state of the evidence. *Annu. Rev. Clin. Psychol.*, 4, 305-324.
- Struzzo, P., De Faccio, S., Moscatelli, E., & Scafato, E. (2006). Early detection of subjects at risk of alcohol abuse in a setting of primary health care in Italy: adaptation of a shorter version of the AUDIT Questionnaire and evaluation of its efficacy in the Italian context. *Bolletino per le Farmacodipende e l'Alcoolismo*, 29, 20-25.
- Svaldi, J., Brand, M., & Tuschen-Caffier, B. (2010). Decision-making impairments in women with binge eating disorder. *Appetite*, 54(1), 84-92.
- Tabachnick, B. G., Fidell, L. S., & Osterlind, S. J. (2001). *Using multivariate statistics* (4th ed.). Boston: Allyn & Bacon.
- Tachi, T., Murakami, K., Murotsu, K., & Washizuka, T. (2001). Affective states associated with bingeing and purging behaviours in Japanese patients with bulimia nervosa. *British Journal of Medical Psychology*, 74(4), 487-496.
- Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and social psychology review*, 6(1), 2-30.
- Tanofsky-Kraff, M., Goossens, L., Eddy, K. T., Ringham, R., Goldschmidt, A., Yanovski, S. Z., ... & Yanovski, J. A. (2007). A multisite investigation of binge eating behaviors in children and adolescents. *Journal of consulting and clinical psychology*, 75(6), 901-913.
- Thompson, J. K., & Stice, E. (2001). Thin-ideal internalization: Mounting evidence for a new risk factor for body-image disturbance and eating pathology. *Current directions in psychological science*, 10(5), 181-183.
- Thompson, R. A., & Calkins, S. D. (1996). The double-edged sword: Emotional regulation for children at risk. *Development and Psychopathology*, 8(01), 163-182.
- Thush, C., & Wiers, R. W. (2007). Explicit and implicit alcohol-related cognitions and the prediction of future drinking in adolescents. *Addictive behaviors*, 32(7), 1367-1383.
- Timmerman, G. M. (1999). Binge eating scale: further assessment of validity and reliability1. *Journal of Applied Biobehavioral Research*, 4(1), 1-12.
- Turrisi, R., & Wiersma, K. (1999). Examination of Judgments of Drunkenness, Binge Drinking, and Drunk-Driving Tendencies in Teens With and Without a Family History of Alcohol Abuse. *Alcoholism: Clinical and Experimental Research*, 23(7), 1191-1198.
- Van Damme, J., Maes, L., Clays, E., Rosiers, J. F., Van Hal, G., & Hublet, A. (2013). Social motives for drinking in students should not be neglected in efforts to decrease problematic drinking. *Health education research*, 28(4), 640-650.

- Van den Berg, P., Thompson, J. K., Obremski-Brandon, K., & Coover, M. (2002). The Tripartite Influence model of body image and eating disturbance: A covariance structure modeling investigation testing the mediational role of appearance comparison. *Journal of psychosomatic research, 53*(5), 1007-1020.
- Vanderlinden, J., Dalle Grave, R., Fernandez, F., Vandereycken, W., Pieters, G., & Noorduin, C. (2004). Which factors do provoke binge eating? An exploratory study in eating disorder patients. *Eating and Weight Disorders-Studies on Anorexia, Bulimia and Obesity, 9*(4), 300-305.
- Vanderlinden, J., Dalle Grave, R., Vandereycken, W., & Noorduin, C. (2001). Which factors do provoke binge-eating? An exploratory study in female students. *Eating Behaviors, 2*(1), 79-83.
- Veilleux, J. C., Skinner, K. D., Reese, E. D., & Shaver, J. A. (2014). Negative affect intensity influences drinking to cope through facets of emotion dysregulation. *Personality and Individual Differences, 59*, 96-101.
- Viner, R. M., & Taylor, B. (2007). Adult outcomes of binge drinking in adolescence: findings from a UK national birth cohort. *Journal of epidemiology and community health, 61*(10), 902-907.
- Vitousek, K., & Manke, F. (1994). Personality variables and disorders in anorexia nervosa and bulimia nervosa. *Journal of abnormal psychology, 103*(1), 137-147.
- Von Ranson, K. M., Iacono, W. G., & McGue, M. (2002). Disordered eating and substance use in an epidemiological sample: I. Associations within individuals. *International Journal of Eating Disorders, 31*(4), 389-403.
- Waller, G., & Osman, S. (1998). Emotional eating and eating psychopathology among non-eating-disordered women. *International Journal of Eating Disorders, 23*(4), 419-424.
- Ward, R. M., & Galante, M. (2015). Development and initial validation of the Drunkorexia Motives and Behaviors scales. *Eating behaviors, 18*, 66-70.
- Waters, A., Hill, A., & Waller, G. (2001a). Internal and external antecedents of binge eating episodes in a group of women with bulimia nervosa. *International Journal of Eating Disorders, 29*(1), 17-22.
- Waters, A., Hill, A., & Waller, G. (2001b). Bulimics' responses to food cravings: is binge-eating a product of hunger or emotional state? *Behaviour Research and Therapy, 39*(8), 877-886.
- Wechsler, H., & Nelson, T. F. (2001). Binge drinking and the American college students: What's five drinks? *Psychology of Addictive Behaviors, 15*(4), 287-291.
- Wechsler, H., & Nelson, T. F. (2006). Relationship Between Level of Consumption and Harms in Assessing Drink Cut-Points for Alcohol Research: Commentary on "Many College Freshmen Drink at Levels Far Beyond the Binge Threshold" by White et al. *Alcoholism: Clinical and Experimental Research, 30*(6), 922-927.

- Wechsler, H., Davenport, A., Dowdall, G., Moeykens, B., & Castillo, S. (1994). Health and behavioral consequences of binge drinking in college: A national survey of students at 140 campuses. *Jama*, *272*(21), 1672-1677.
- Wechsler, H., Dowdall, G. W., Davenport, A., & Rimm, E. B. (1995). A gender-specific measure of binge drinking among college students. *American journal of public health*, *85*(7), 982-985.
- Wechsler, H., Lee, J. E., Kuo, M., & Lee, H. (2000). College binge drinking in the 1990s: A continuing problem results of the Harvard School of Public Health 1999 College Alcohol Study. *Journal of American College Health*, *48*(5), 199-210.
- Wegner, K. E., Smyth, J. M., Crosby, R. D., Wittrock, D., Wonderlich, S. A., & Mitchell, J. E. (2002). An evaluation of the relationship between mood and binge eating in the natural environment using ecological momentary assessment. *The International Journal of Eating Disorders*, *32*(3), 352-361.
- Weinstein, N. D. (1980). Unrealistic optimism about future life events. *Journal of personality and social psychology*, *39*(5), 806-820.
- Weinstein, N. D. (1987). Unrealistic optimism about susceptibility to health problems: Conclusions from a community-wide sample. *Journal of behavioral medicine*, *10*(5), 481-500.
- Weiss, N. H., Sullivan, T. P., & Tull, M. T. (2015). Explicating the role of emotion dysregulation in risky behaviors: a review and synthesis of the literature with directions for future research and clinical practice. *Current opinion in psychology*, *3*, 22-29.
- Weitzman, E. R., Nelson, T. F., & Wechsler, H. (2003). Taking up binge drinking in college: The influences of person, social group, and environment. *Journal of Adolescent Health*, *32*(1), 26-35.
- Wheeler, H.A., Adams, G.R, & Keating, L. (2001). Binge eating as a means for evading identity issues: The association between an avoidance identity style and bulimic behavior. *Identity: An International Journal of Theory and Research*, *1*(2): 161-178.
- Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and individual differences*, *30*(4), 669-689.
- Whiteside, U., Chen, E., Neighbors, C., Hunter, D., Lo, T., & Larimer, M. (2007). Difficulties regulating emotions: Do binge eaters have fewer strategies to modulate and tolerate negative affect? *Eating Behaviors*, *8*(2), 162-169.
- Williams, A., & Clark, D. (1998). Alcohol consumption in university students: the role of reasons for drinking, coping strategies, expectancies, and personality traits. *Addictive behaviors*, *23*(3), 371-378.

- Williams, R. J., & Ricciardelli, L. A. (2003). Negative perceptions about self-control and identification with gender-role stereotypes related to binge eating, problem drinking, and to comorbidity among adolescents. *Journal of adolescent health, 32*(1), 66-72.
- Wilson, G. T. (1991). The addiction model of eating disorders: A critical analysis. *Advances in Behaviour Research & Therapy, 13*, 27-72.
- Wolff, G. E., & Wittrock, D. A. (1998, March). A description of eating behavior in a college population using the questionnaire of eating and weight patterns. In *Poster presented at the 19th annual Society of Behavioral Medicine Conference, New Orleans, LA*.
- Woods, A. M., Racine, S. E., & Klump, K. L. (2010). Examining the relationship between dietary restraint and binge eating: Differential effects of major and minor stressors. *Eating behaviors, 11*(4), 276-280.
- Yanover, T., & Thompson, J. K. (2008). Eating problems, body image disturbances, and academic achievement: Preliminary evaluation of the eating and body image disturbances academic interference scale. *International Journal of Eating Disorders, 41*(2), 184-187.
- Yanovski, S. Z., Leet, M., Yanovski, J. A., Flood, M. N., Gold, P. W., Kissileff, H. R., & Walsh, B. T. (1992). Food selection and intake of obese women with binge-eating disorder. *The American journal of clinical nutrition, 56*(6), 975-980.
- Zahn-Waxler, C., Shirtcliff, E. A., & Marceau, K. (2008). Disorders of childhood and adolescence: Gender and psychopathology. *Annual Review of Clinical Psychology, 4*, 275-303.
- Zimbardo, P. G., Keough, K. A., & Boyd, J. N. (1997). Present time perspective as a predictor of risky driving. *Personality and Individual Differences, 23*(6), 1007-1023.
- Zuckerman, M. (1979). *Sensation seeking. Beyond the optimal level of arousal*. Hillsdale, NJ: Ellbaum.
- Zullig, K.J., Valois, R.F., Huebner, E.S., Oeltmann, J.E., & Drane, J.W. (2001). Relationship between perceived life satisfaction and adolescents' substance abuse. *Journal of Adolescent Health, 29*(4), 279-288.

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