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# Validation and Transference of Drinking Motives

## Based on The Motivational Model of Alcohol Use

Emmanuel Nicolás Kuntsche

University of Bamberg Press

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## Contents

## Summary

This work deals with three basic assumptions in contemporary drinking motive research. The first is that the four-dimensional model of drinking motives and links between the motive dimensions and alcohol use hold true among adolescents from different countries. The results of three empirical studies revealed striking cross-countries consistencies. This concerned not only the confirmation of the four-dimensional factor structure in the countries separately, but also its equivalence across countries in terms of item loadings on the four factors and factor variances and inter-correlations. The rank order in the mean scores of the four motives was also invariant across countries: Adolescents scored highest on social motives followed by enhancement, coping, and conformity motives, in said order. Moreover, evidence reveals that adolescents from countries in northern Europe differ in their drinking motivations from their counterparts in southern/central European countries and that the link between drinking culture (northern vs. southern/central Europe) and alcohol use was mediated by drinking motives.

The second assumption states that drinking motives can be used to better target intervention approaches due to the proximity of drinking motives to alcohol-related outcomes. The results of three studies provide evidence that drinking motives constitute a final pathway to drinking patterns, i.e. the impact of more distal aspects such as alcohol expectancies, personality factors and parental drinking habits is mediated through drinking motives. This makes drinking motives particularly promising candidates to be considered in intervention approaches which we tested in two subsequent studies. In the first, we investigated whether reflecting on drinking motives in the context of a group activity following hospital discharge has an impact on participants' drinking behavior at follow up. The results indicate that among adolescents admitted to hospital due to an acute alcohol intoxication the increase in heavy episodic drinking, which usually occurs from mid to late adolescence, was prevented when

participating in both a MI-based intervention and in a group activity in which drinking motives and responsible drinking was discussed. Unfortunately, in this study it remains unclear to what degree the demonstrated preventive effect can be attributed to drinking motives and according changes towards intentions to drink more responsibly in the future rather than to other elements of the group activity. In a second study, we used drinking motives to improve targeting the content of the intervention to the needs and problems of riskily drinking adolescents. The results showed that girls who received the intervention in a motive-tailored way indicated less frequent drinking and a lower binge drinking frequency at follow-up than girls who received the similar psychosocial intervention but not motive-tailored. Unfortunately, similar differences were not found among boys, i.e. their alcohol consumption reduction at follow-up was independent of whether they received intervention in a motive-tailored way or not. It appears interventions that take account of adolescents' needs and problems, as expressed by their drinking motives, are more effective to reduce girls' frequent and risky drinking.

The third assumption deals with the question to what degree considerations of the Motivational Model of Alcohol Use can be transferred to other domains of human functioning. In a first study, we used these considerations to develop the Internet Motive Questionnaire for Adolescents (IMQ-A). We obtained empirical evidence indicating that the IMQ-A is a valid and reliable instrument to measure motives for Internet use in adolescent populations that may also help identify dysfunctional Internet users for which intervention approaches are warranted. In a second study, we used the considerations of the Motivational Model to develop the Motives for Listening to Music Questionnaire (MLMQ). The results confirmed the MLMQ's four-dimensional factor structure and the hypothesized associations between coping motives and health-related outcomes, between social motives and peer-related activities and between conformity motives and being depressed and a victim of bullying. In a third study, we confirmed that music motives remain significant predictors of health-related outcomes

among alcohol using adolescents when drinking motives were taken into account. Apparently, music serves important functions in the lives of young people, even for those who consume alcohol for different motives. In a fourth study, we developed the Amphetamine-type stimulant Motive Questionnaire (AMQ) the same way as the IMQ-A and the MLMQ, in a fourth study. The reported results clearly indicate that the considerations of the Motivational Model can also be successfully transferred to the use of illegal substances such as amphetamine-type stimulants and applied in a clinical population such as amphetamine-type stimulant addicted patients.

Taken together, the 12 empirical studies included here clearly demonstrate that drinking motives (a) are cross-culturally valid, ($b_1$) serve as proximal predictors of alcohol use, i.e. the gateway through which more distal factors such as alcohol expectancies, personality factors and parental drinking habits are mediated, ($b_2$) are useful in intervention approaches to reduce adolescent risky drinking and (c) can be transferred to other domains of human functioning such as using the Internet, listening to music and using amphetamine-type stimulants.

# Introduction

## Drinking Motives in Historical Perspective

Alcohol consumption is known to be determined by a large variety of factors both within the individual (e.g. genetic disposition, personality characteristics, cognitions) and in his or her environment (societal, neighborhood, family, peer group, and situational characteristics: Ham & Hope, 2003; Hawkins, Catalano & Miller, 1992; Kuntsche, Rehm & Gmel, 2004). Drinking motives have been conceptualized and empirically validated as constituting a final pathway to alcohol use. As discussed in further detail below in Assumption 2, drinking motives function as a gateway through which more distal influences (alcohol expectancies, personality factors, parental drinking habits etc.) are mediated (e.g. Lammers, Kuntsche, Engels, Wiers, & Kleinjan, 2013; Kuntsche, Wiers, Janssen, & Gmel, 2010; Kuntsche, Von Fischer & Gmel, 2008; Müller & Kuntsche, 2011; Van Damme, Maes, Kuntsche, Crutzen, De Clercq, Van Lippevelde, & Hublet, 2015).

Drinking motives are not a recent topic of research, i.e. scientific studies were conducted as early as the late 1940s (cf. Kuntsche, 2007, for an historical overview). By the end of the 1960s, questions on drinking motives were incorporated in large US American surveys (Cahalan, Cisin & Crossley, 1969; Jessor, Carman & Grossman, 1968). However, these early studies were not based on a comprehensive theory and failed to place drinking motives within a wider research context, e.g. in their interplay with individual, situational and social factors. This might be the reason why until the end of the 1990's research had mainly focused on other alcohol-related cognitions, such as expectancies. In fact, from 1980 until 2005, scientific publications on alcohol expectancies outnumbered those on drinking motives ty three times the amount (see Kuntsche, 2007, for an overview).

Three milestones have brought drinking motives back on the top of the research agenda on alcohol-related cognitions. The first milestone occurred with the development of a theoretical model that laid the foundations for a comprehensive understanding of the motives

underlying alcohol use (Cooper, 1994). In their Motivational Model of Alcohol Use, Cox and Klinger (1988, 1990) argue that striving for a goal is the organizing force behind behavior, and that people strive to attain certain valued goals because they expect a desired change in affect. Essentially, they argue that people's lives are organized around the pursuit and enjoyment of incentives which have the potential to satisfy particular needs; a circumstance that is explained in further detail below. From this perspective, a person decides to use alcohol as a function of the anticipated positive affective consequences and whether he or she believes that these outweigh the consequences of not consuming alcohol. In short, expected affective change – whether increased positive feelings or decreased negative ones – is thought to drive the decision to consume alcohol in a more or less rational manner (Klinger & Cox, 2004). More precisely, the Motivational Model assumes that individuals drink to obtain positive outcomes or to avoid negative ones. In addition, they may be motivated by internal rewards such as enhancement of a desired emotional state or by external rewards such as social approval.

Based on these considerations, the second milestone was accomplished with the development of a theory-based, reliable and valid instrument to assess drinking motives. By crossing the two dimensions related to the desired incentives from drinking, namely the 'source' (internal vs. external) and the 'valence' (positive vs. negative reinforcement), the Drinking Motive Questionnaire Revised (DMQ-R: Cooper, 1994) measures four motive categories using five items for each: enhancement (internal, positive reinforcement; e.g. drinking to have fun); coping (internal, negative reinforcement; e.g. dinking to forget problems); social (external, positive reinforcement: e.g. dinking to be sociable); and conformity (external, negative reinforcement; e.g. drinking to fit in with a group). A variety of subsequently conducted studies have demonstrated the excellent measurement properties of the DMQ-R in different countries and in subgroups within countries as well as across multiple counties (e.g. Hauck-Filho, Teixeira & Cooper, 2012; Kuntsche, Knibbe, Gmel & Engels, 2006a; Kuntsche, Stewart & Cooper, 2008; Kuntsche, Nic

Gabhainn, Roberts, Windlin, Vieno, Bendtsen et al., 2014; MacLean & Lecci, 2000). As a consequence, it has become the most widely used instrument to assess drinking motives (Cooper, Kuntsche, Levitt, Barber & Wolf, 2016; Kuntsche, Knibbe, Gmel & Engels, 2005).

The third milestone, on which contemporary knowledge on the link between drinking motives and alcohol consumption and related problems is often based, consists of a comprehensive literature review of the drinking motives research up to the early 2000's (Kuntsche, Knibbe, Gmel & Engels, 2005). This review summarized evidence emerging from drinking motive literature over a 15-year period by including publications from 1989 (the year after the development of the Motivational Model: Cox & Klinger, 1988) until 2003. It revealed that most young people reported drinking for social motives, some indicated enhancement motives, and only a few reported coping motives. Social motives appear to be associated with moderate alcohol use, enhancement with heavy drinking, and coping motives with alcohol-related problems. This review has been extensively cited in scientific literature and has thus potentially stimulated a bulk of studies on this subject.

## What the Present Work Offers

Despite these milestones and considerable advances, empirical evidence on central assumptions of the drinking motives has remained rather scarce. This concerns, for example, the fact that most evidence was derived from Western industrialized countries such as the USA, Canada, and Switzerland. There are particularly few studies that have directly compared drinking motives in samples from Western industrialized countries with those from African or Asian countries. These studies found, for example, that US American students scored higher on social motives than their Japanese peers (Nagoshi, Nakata, Sasano, & Wood, 1994) but lower than Nigerian students (Gire, 2002). Unfortunately, both studies did not use the theory-grounded four-dimensional concept of drinking motives described above. Therefore, and also due to the lack of

other cross-national studies investigating cultural differences in drinking motives, it is difficult to disentangle cultural from possible measurement differences and to integrate these results in the wider research context. Thus, there is the need to investigate whether the four-dimensional structure and mean levels of enhancement, coping, social, and conformity motives, and their links to alcohol-related outcomes differ among adolescents from multiple countries. Only recently, studies from countries such as Brazil (Hauck-Filho, Teixeira, & Cooper, 2012), China (Cheng, Phillips, Zhang, & Wang, 2016; Sun, Windle & Thomson, 2015), Hungary (Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011), Italy (Mazzardis, Vieno, Kuntsche, & Santinello, 2010), Spain (Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011) and Sweden (Öster, Arinell, & Nehlin, 2016) have investigated the structure of drinking motives and their links to alcohol-related outcomes. However, since these studies differ considerably in sample characteristics and applied methodologies cross-cultural comparisons and conclusions remain difficult. Moreover, with the exception of Hungary, all the cross-cultural studies were compared Western industrialized countries. Based on a series of studies, this work will provide evidence on the first assumption, namely that the four-dimensional model of drinking motives and links between the motive dimensions and alcohol use hold true among adolescents from different countries.

The second assumption states that drinking motives can be used to improve targeting of intervention approaches because of the proximity of drinking motives to alcohol-related outcomes. In a previous study, we argued that both from the conceptual point of view and in terms of prevention, the factors most proximate to alcohol consumption are of strategic importance (Kuntsche, Knibbe, Gmel & Engels, 2006a). Prevention and intervention efforts are not only likely to access these factors with greater ease than more distal factors, they also tend to reflect or incorporate such distal factors related to, for example, personality, social context or culture. Drinking motives are defined as the final

decision to drink or not and therefore thought to be the most proximal factor for engaging in drinking (Cooper, 1994; Cox & Klinger, 1988, 1990). Drinking motives are, thus, promising candidates to identify homogeneous subgroups of drinkers who are motivated by particular needs to which prevention efforts can be targeted (Kuntsche, Knibbe, Engels, & Gmel, 2010). Assumption two has therefore two parts. The first part contains evidence that drinking motives actually mediate the link between more distal factors and alcohol related outcomes in three domains, i.e. alcohol expectancies, personality factors and parental drinking habits. The second part demonstrates in which ways drinking motives can be used in intervention approaches, for example to improve their targeting to the needs and problems of homogeneous subgroups of drinkers expressed by a particular constellation of drinking motives.

The third assumption deals with the question to what degree the four basic categories of drinking motives based on Motivational Model of Alcohol Use (Cox & Klinger, 1988, 1990) can be transferred to other domains of adolescent functioning. Despite being applied exclusively to alcohol, the Motivational Model incorporates aspects of general human functioning and offers a comprehensive theory for explaining human behavior. As explained in further detail below the goal pursuit initiated by the affective change that individuals expect from achieving the goal is at the core of the model. This can be achieved by consuming alcohol but also, for example, by using the Internet (for entertainment or other purposes), by listening to music or by using other psychoactive substances. More specifically, the studies included in Assumption three provide evidence to what degree motives for (a) using the Internet, (b) listening to music, and (c) using amphetamine-type stimulants (ATS) can also be classified in four broad categories obtained by crossing the two dimensions ‘valence’ (positive vs. negative reinforcement) and ‘source’ (internal vs. external) as assumed by the Motivational Model.

## Theoretical Underpinnings of Drinking Motives: Motivation, Goal Pursuit, and Affective Change

For a better understanding of the concept of drinking motives it is useful to briefly review its theoretical underpinnings. This concerns for example the definition of motivation as a process of instigating, sustaining, and directing physical or psychological activities, including internal forces such as drives, impulses, and desires (Corsini, 2002). This process may operate unconsciously or consciously, physiologically or psychologically; it stimulates, maintains and leads behavior. Motivational factors are immediate or basic needs, interests, incentives, rewards, and personal and social drives, for example, the strive for self-esteem, security, or fortune. Motivation is thus characterized by internal states of humans (or animals) which lead to initiation, persistence, and direction of behaviors towards particular goals (Klinger & Cox, 2004).

The successful pursuit of goals is ultimately the factor that ensures survival (Klinger & Cox, 2004). All organisms must meet the challenge of finding food, avoiding adverse situations, locating hospitable environments to live, and reproduction. To meet these challenges, plants and animals have adopted particular survival strategies: plants depend on the environment in which they are located. Animals and humans, in contrast, have the advantage of being mobile and are able to actively change environments. The price to pay for this independence is that they must find and pursue conditions and consume substances that meet their needs. Thus, the successful pursuit of goals is the most basic requirement for the survival of animals and humans.

This pursuit is a complex enterprise. First, the information on a goal and how it can be obtained needs to be represented in the brain. Research revealed that the destruction of specific brain areas leaves people unable to persistently pursue goals and to lead a normal life (e.g., Damasio, 1994; Bechara, Damasio, Tranel, & Damasio, 1997). Moreover, to be ready to act without consciously thinking exclusively about the goal, individuals need

to be sensitized to the goal–related cues. These cues or stimuli can be internal (e.g., ideas or thoughts) or external (e.g., seeing other people drinking in a bar). Encountering these cues stimulate either mental activity (e.g., contemplating about ordering a drink when entering a bar) or goal-directed actions (e.g., ordering a drink). Sensitization represents an efficient way of seizing opportunities to attain or continue to pursue personal goals.

In other words, goal pursuit can be described as a process that leads an individual from the commitment to a particular goal to either attaining it or abandoning the pursuit (Klinger & Cox, 2004). Either way, a representation of the pursuit and the goal remains stored in the memory. Goal resignation or attainment does not mean deleting or forgetting the goal-related information but rather impeding responses to all but the most salient goal-related cues. A particular song or perfume, for example, may remind a man of a women he met long time ago. Consequently, the representation of a past goal and its pursuit is not consciously present at any time or situation. However, when a goal-related cue is encountered the representation can be activated from memory and consciously reflected. In this way, adolescent alcohol use can be seen as rational goal-directed action (Maggs, 1997).

In general, individuals strive for circumstances that make them feel at ease, by either providing them with pleasure or by relieving or alleviating discomfort. In other words, the affective change that people expect from attaining the goal is at the origin of goal pursuit. In this way, the pursuit of affective change represents the pre-requirement for individuals to recognize the significance of a potential goal. Personal goals become incentives when a person expects that their realization is likely to result in a desirable change in affect (Klinger & Cox, 2004). This can happen either through positive reinforcement (e.g., acquisition of incentives that increased pleasure) or through negative reinforcement (e.g., acquisition of incentives that reduces discomfort).

At any time or situation, individuals are doomed to choose between a variety of incentives. Often we have clear goal preferences such as particular meals or beverages, music or movies, cars or holiday destinations. However, when the value and cost of a range of alternatives are balanced (e.g., the more attractive cars or holiday destinations are also the more expensive ones) individuals may hesitate or find it difficult to make a decision. In contrast, individuals tend to prefer an incentive if they attribute high personal value and low costs compared to other alternatives (e.g., to go to an attractive holiday destination nearby or to buy a luxury car second hand). Thus, the choice that a particular goal become an incentive in a given circumstance is the result of two main determinants: the attributed value and the subjectively assessed possibility of attaining the goal (expectancy). Thus, a person is likely select the choice with the highest value-expectancy product; it is the ratio between personal value and expected cost that makes a goal an incentive. Persons may, of course, overestimate the intensity and duration of expected positive change and underestimate the costs required to attain the chosen goal. Nevertheless, expected affective change can be considered the most reliable determinant of personal choice of incentives (Klinger & Cox, 2004).

## Theoretical Underpinnings Continued: The Description of the Motivational Model of Alcohol Use

From what is stated above we can say that the expectancy that drinking alcohol results in desirable affective changes increases the likelihood that alcohol consumption becomes an incentive. If so an internal motivational process is initiated which directs attention, thoughts, emotions, and behavior of a person towards drinking alcohol as a personal goal. Unfortunately, such a theory-based understanding of drinking motives was not developed before the late 1980s. In earlier studies, a variety of drinking motive items were incorporated in large surveys of the general population studies (Cahalan, Cisin, & Crossley, 1969) and college students

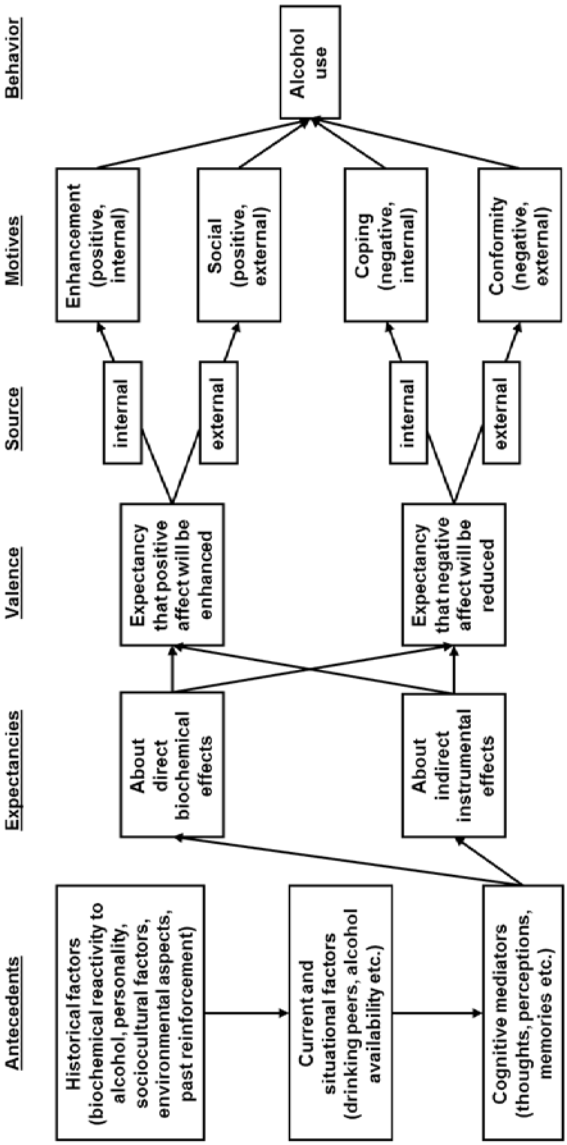
(Jessor, Carman, & Grossman, 1968) in the United States. The results were then classified into two broad categories according to positive and negative reinforcement (Kuntsche, Knibbe, Gmel, & Engels, 2005). Despite the fact that more and more drinking motive items and dimensions were included in scientific studies the principal aim remained to collect information on subjective statements of people's intention in engaging in alcohol use. Another limitation was that none of these early studies considered drinking motives within a larger framework.

In the Motivational Model of Alcohol Use, Cox and Klinger (1988; 1990) formulated that a person makes a conscious or unconscious decision about whether or not he or she will consume alcohol. The decision to drink is thought to be a combination of rational and emotional processes based on the affective change that an individual expects to obtain through alcohol consumption. However, as mentioned above, the individual does not need be aware of decision making process that leads to alcohol consumption because becoming sensitized to goal–related cues and their pursuit can be described as a latent process, in which decisions – including those leading to alcohol consumption – are mostly automatized and unconscious. This does not signify that a person would not be able to consciously reflect on the motivational process or the final decision taken.

As illustrated in Figure 1, the model assumes that the decision to drink is embedded in historical factors, current and situational factors and expected effects. Historical factors comprise the individual's biochemical reactivity to alcohol, personality factors, determinants of the socio-cultural environment and the kind of past experiences with alcohol consumption, which influence the personal drinking motivation at present. Obviously, biochemical mechanisms are closely related to the genetic disposition of individuals which determines how the body reacts to alcohol intake. This also includes individual variation in alcohol metabolism. Persons with insufficient levels of enzymes metabolize a given amount of alcohol more slowly and therefore experience stronger adverse effects than persons with an adequate level of these enzymes. Since personality factors

(impulsivity, sensation-seeking, extraversion, conscientiousness, neuroticism etc.) represent salient ways in which persons differ in their motivational styles (McCrae & John, 1992) authors argue that drinking motives constitute essential meditators in the link between personality characteristics and alcohol-related outcomes (Cooper, Agocha, & Sheldon, 2000; Kuntsche, Von Fischer, & Gmel, 2008).

Figure 1: Graphical representation of assumptions of the Motivational Model (adapted from Kuntsche, Knibbe, Engels & Gmel, 2005)



Sociocultural and environmental factors include culture-specific drinking patterns as well as drinking habits of significant others, for example peers or parents. From a cultural perspective, there is a closer link between alcohol and violence, for example, in countries in which drunkenness is likely to be considered a "time out" behavior than in traditional wine-producing countries, in which alcohol use is often consumed moderately, when accompanying meals, for instance (Room, 2001). Concerning the closer social context, research has also shown that adolescents adopt excessive drinking habits of family members, even if they perceive the negative consequences resulting from such a behavior (Kuntsche & Meyer, 2002). Affiliation with alcohol-consuming peers has been found to be a particular strong risk factor of alcohol use in adolescence (Hawkins, Catalano, & Miller, 1992; Kuntsche & Jordan, 2006). This is due to both socialization and selection processes: adolescents tend join like-minded others and their social interaction will reinforce consumption behaviors to increase similarity among group members (Engels, Knibbe, De Vries, Drop, & Van Breukelen, 1999; Urberg, Luo, Pilgrim, & Degirmencioglu, 2003). Moreover, if someone has made positive experiences from past drinking experiences, she or he is likely to reinforce this behavior in the future.

Situational and current features include characteristics of the environment in which individuals decide whether to drink or not. These are, for example, alcohol availability at a given place and being surrounded by people who drink. Cognitive mediators are, for example, any kind of perceptions, thoughts, and memories that determine in which way historical, situational and current factors are processed and stored in memory, and in which way they are ultimately related to the nature of individual expectancies about the chemical and instrumental effects of alcohol use on the personal affect. These expectations are also associated with short- and long-term experiences with alcohol. For example, it can happen that individuals tend to exaggerate the (positive) short-term consequences while downplaying the (negative) long-term effect.

At the core of the model is the assumption that motivation to consume alcohol can be classified according to two underlying dimensions. These consist in the valence (positive or negative) and the source (internal or external) of outcomes individuals expect to obtain when drinking. They are supposed to drink to achieve or reinforce positive outcomes (positive reinforcement) or to avoid or attenuate negative ones (negative reinforcement). Additionally, individuals are supposed to be motivated by the direct psychoactive effect that alcohol has on the body or its indirect, 'symbolic' effect. On the one hand, alcohol can be used for internal rewards, such as enhancement of a desired emotional state. On the other, alcohol can be used instrumentally to obtain external rewards, such as gaining social approval or avoiding social rejection, i.e. fitting into the perceived drinking norm in a given situation or social context. Crossing these two dimensions results in four distinct drinking motive categories: (a) internal/personal positive reinforcement (e.g. drinking to have fun), (b) external/instrumental positive reinforcement (e.g. drinking to celebrate with friends), (c) internal/personal negative reinforcement motives (e.g. drinking to cheer up when in a bad mood or to forget about problems), and (d) external/instrumental negative reinforcement motives (drinking to avoid peer rejection).

To conclude, the Motivational Model drinking motives are based on the assumption that individuals drink in order to attain particular valued outcomes (Cooper, 1994). Thus, drinking motives represent a decisional framework in which alcohol occurs based on situational factors and personal experiences and expectancies.

It is important to stress that although alcohol expectancies and drinking motives are sometimes used interchangeably in the literature (Kuntsche, Knibbe, Engels & Gmel, 2007), they are conceptually different. “Expectancies are people’s beliefs about what will happen if they (or other people) drink alcohol, whereas motives are the value placed on the particular effects they want to achieve, which motivate them to drink” (Cox and Klinger, 2004, p. 124). In other words, a person who expects a desired effect from alcohol consumption will not necessarily drink to achieve the

desired effect simply because the corresponding expectancy is endorsed (Cooper, 1994). As mentioned above, the Motivational Model assumes that each person (consciously or unconsciously) makes a decision about whether he or she will consume alcohol (Cox & Klinger, 1988, 1990). Consequently, drinking motives are thought to be the final step towards alcohol use, i.e. a gateway through which more distal influences (alcohol expectancies, personality factors, parental drinking habits etc.) are mediated (e.g. Lammers, Kuntsche, Engels, Wiers, & Kleinjan, 2013; Kuntsche, Wiers, Janssen, & Gmel, 2010; Kuntsche, Von Fischer & Gmel, 2008; Müller & Kuntsche, 2011; Van Damme, Maes, Kuntsche, Crutzen, De Clercq, Van Lippevelde, & Hublet, 2015).

As mentioned above, the following will provide empirical evidence on three basic assumptions in contemporary drinking motive research and theory. The first is that the four-dimensional model of drinking motives and links between the motive dimensions and alcohol use hold true among adolescents from different countries. The second assumption states that drinking motives can be used to improve targeting intervention approaches due to the proximity of drinking motives to alcohol-related outcomes. The third assumption deals with the question whether the four basic categories of drinking motives based on Motivational Model of Alcohol Use can be transferred to other domains of adolescent functioning, namely using the Internet, listening to music, and using ATS.

## Assumption 1

# The Four-Dimensional Model and Links to Alcohol Use Hold True among Adolescents from Different Countries [1]

[1] This chapter is based on

Kuntsche, E., Stewart, S. H., & Cooper, M. L. (2008). How stable is the motive-alcohol use link? A cross-national validation of the Drinking Motive Questionnaire Revised (DMQ-R, Cooper, 1994) among adolescents from Switzerland, Canada, and the US. *Journal of Studies on Alcohol and Drugs, 69*(3), 388-396.

Kuntsche, E., Nic Gabhainn, S., Roberts, C., Windlin, B., Vieno, A., Bendtsen, P., Hublet, A., Tynjälä, J., Välimaa, R., Dankulincová, Z., Aasvee, K., Demetrovics, Z., Farkas, J., van der Sluijs, W., Gaspar de Matos, M., Mazur, J., & Wicki, M. (2014). Drinking motives and links to alcohol use in 13 European countries. *Journal of Studies on Alcohol and Drugs, 75*(3), 428–437.

Kuntsche, E., Wicki, M., Windlin, B., Nic Gabhainn, S., Roberts, C., Vieno, A., Bendtsen, P., Hublet, A., Tynjälä, J., Välimaa, R., Dankulincová, Z., Aasvee, K., Demetrovics, Z., Farkas, J., van der Sluijs, W., Gaspar de Matos, M., & Mazur, J. (2015). Drinking motives mediate drinking culture differences but not gender differences in adolescent alcohol use. *Journal of Adolescent Health, 56*(3), 323-329.

## Drinking Motives in Cross-Cultural Perspective

As mentioned above, the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 1990) assumes that all kinds of reasons or motives for drinking can be subsumed under four distinct motive categories derived by crossing the two dimensions 'source' (internal vs. external) and 'valence' (positive vs. negative reinforcement). Although biological, social and environmental factors are acknowledged or incorporated the Motivational Model focus on cognitive processes. At the core of the model is that the decision to drink is a combination of rational and emotional processes based on the affective change that an individual expects to obtain through alcohol consumption.

The intra-individual nature of the cognitive processes leads to the assumption that the four-category classification of drinking motives holds true across individuals with different cultural backgrounds. Consequently, Cooper (1994) demonstrated that this classification was robust when comparing girls and boys, older and younger adolescents and whites and blacks in the USA. For the first time outside North America, Kuntsche and colleagues (2006a; 2009) confirmed the four-factor structure among girls and boys, older and younger adolescents and those from different linguistic regions in Switzerland. Recent evidence demonstrate that the four-dimentional classification holds true in different countries such as Brazil (Hauck-Filho, Teixeira, & Cooper, 2012), China (Cheng, Phillips, Zhang, & Wang, 2016; Sun, Windle & Thomson, 2015), Hungary (Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011), Italy (Mazzardis, Vieno, Kuntsche, & Santinello, 2010), Spain (Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011) and Sweden (Öster, Arinell, & Nehlin, 2016). However, a strict comparison of the factor structure of drinking motives across adolescents from different countries remained scarce (for a notable exception, see Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011).

The first study on which this chapter is based (Kuntsche, Stewart, & Cooper, 2008) provides further evidence on the consistency of the four-dimensional factor structure of drinking motives and their association with adolescent alcohol use (quantity and frequency), risky drinking (consuming five or more drinks on a single occasion), and alcohol-related problems (with friends, family members, and at school) among adolescents from North America (Canada and the United States) and from a multilinguistic country in Europe (Switzerland). Switzerland is an ideal case for comparisons between North America and Europe because it represents different European drinking cultures inside one country. The hypotheses were that there are (1) no significant cross-country differences in the overall four-factor structure of drinking motives and (2) a high similarity in the link between drinking motives and alcohol outcomes across the three countries. Confirming these two hypotheses would provide additional evidence supporting the generalizability of four-factor model of drinking motives in explaining adolescent drinking behavior across cultural contexts.

Confirmatory factor analysis and structural equation modeling were conducted based on data from Switzerland (n = 5,118; mean age = 15.3), Canada (n = 2,557; mean age = 15.7), and the United States (n = 607; mean age = 15.7). Taken together, the results revealed a striking consistency across the three countries (Kuntsche, Stewart, & Cooper, 2008). This concerned not only the confirmation of the four-dimensional factor structure in the three countries separately but also the equivalence across countries in term of item loadings on the four factors and factor variances and inter-correlations. Moreover, for each drinking motive dimension in each country, Cronbach's alpha values showed good internal consistencies (Nunnally & Bernstein, 1994).

The rank order in the mean scores of the four motives was also invariant across countries: Adolescents scored highest on social motives followed by enhancement, coping, and conformity motives, in that order. This was consistent with previous reviews observing such rank orders across studies (Cooper, Kuntsche, Levitt, Barber & Wolf, 2016; Kuntsche,

Knibbe, Gmel & Engels, 2005). Additionally, the obtained results demonstrated that the link between drinking motives and all alcohol-related outcomes were equivalent across countries. This was also consistent with previous studies showing, for example, that enhancement and coping motives are most strongly associated to risky drinking (e.g., Cooper, 1994; Kuntsche, Knibbe, Gmel, & Engels, 2005, 2006a; Kuntsche & Kuntsche, 2009).

These cross-cultural similarities in drinking motives concerning factor structure, internal consistencies, motive rank order, and links to alcohol-related outcomes are astonishing given differences in drinking culture, legal drinking age (World Health Organization, 2004), and the geographic locations of Switzerland, Canada, and the United States. Furthermore, because the data originated from three separately conducted surveys without common study protocol, the three samples differed regarding survey year (CH: 2003; CA: 2002; U.S.: 1989/1990), study design (CH: questionnaires mailed to selected classes; CA: questionnaires distributed personally at school assemblies; U.S.: face-to-face interviews of a randomly selected households), and answer categories and wording of the alcohol-related questions.

## Testing Cross-Cultural Similarities of Drinking Motives across 13 Countries

Taken together, the previous study provides not only important evidence to back up assumptions of the Motivational Model in general but also demonstrates that the four-dimensional model and links to alcohol use hold true among adolescents from different countries in particular (Kuntsche, Stewart, & Cooper, 2008). However, the evidence originating from only three countries, the age of the data (obtained in one and two decades ago) and that the samples were not strictly comparable are among the study's limitations.

Therefore, in the second study on which this chapter is based, drinking motives were included in a cross-national comparative study before carrying out the fieldwork; i.e. most data for this study were obtained through the Health Behaviour in School-aged Children (HBSC) project. Out of the 43 countries participating in the 2009/10 survey, 11 agreed to include the Drinking Motives Questionnaire Revised Short Form (DMQ-R SF: Kuntsche & Kuntsche, 2009). Only the Hungarian and Italian data were gathered in addition to the HBSC data collection, however, using a comparable procedure. This is important because, at that time, only one study provided cross-cultural evidence between two European countries (i.e. Hungary and Spain: Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011). The results confirmed the presence of the four-dimensional motive structure and the rank order (social > enhancement > coping > conformity) in both countries. However, the latter was stronger in Hungary, i.e. Hungarian participants scored higher on social, enhancement, and coping motives than their counterparts in Spain.

Based on a sample of 33,813 alcohol-using adolescents from 13 countries across Europe that together cover the age range from early to late adolescence (age 11-19), the Kuntsche et al. (2014) study set out to test the following hypotheses: (H1) confirmation of the four-dimensional factor structure of drinking motives as measured by the DMQ-R SF (Kuntsche & Kuntsche, 2009); (H2) consistency of rank order in motive endorsement (social motives are the most frequently indicated motives followed by enhancement, coping, and conformity motives, in that order); (H3) social motives are related to drinking frequency but not with the frequency of drunkenness; (H4) enhancement motives, followed by coping motives, are most strongly positively associated with the frequency of drunkenness; (H5) conformity motives are inversely associated with both drinking and the frequency of drunkenness; and (H6) the hypotheses 1-5 hold in in all adolescent age groups across all 13 countries.

From a methodological point of view, this study also brought an innovation. Besides the traditional methods such as confirmatory factor

analysis to confirm the four-factor structure of drinking motives and multiple regression models to investigate associations with alcohol use, latent growth curve modelling (LGCM) was performed to test the order of motive endorsement within individuals; which had been tested in previous studies with either mixed-model ANOVA (Kuntsche, Cooper & Stewart, 2008) or MIMIC models (Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011). In LGCM, the different drinking motive scores were treated as repeated measures within individuals and social motives were set as the intercept since they are hypothesized to be the most frequently indicated motive dimension. The slope then provides evidence for the assumed decrease in motive endorsement from social to enhancement to coping to conformity motives.

Supporting H1, the results showed a good model fit of the assumed four-factor model across countries with only two exceptions concerning Estonia and Portugal. Languages, connotations or particularities in the translation process may be partly responsible for the lower model fit in these two countries. The highly consistent rank order of the level of social motives followed by enhancement, coping, and conformity, in that order, supported H2. The fact that drinking motives are closely related to personality traits (Cooper, Kuntsche, Levitt, Barber & Wolf, 2016; Kuntsche, Knibbe, Gmel & Engels, 2006b) may be among the reasons for this result. In fact, out of 75 comparisons (cf. Table 3 in Kuntsche, Nic Gabhainn, Roberts, Windlin, Vieno, Bendtsen et al., 2014), there was only one deviation from the general rank order. Among 14-16-year old Finns, the endorsement of enhancement motives was slightly higher than the one for social motives. One reason may be the traditional Scandinavian drinking culture, in which drinking to have fun and to get drunk is rather common and socially acceptable (Kuntsche, Rehm & Gmel, 2004; Room, 2001).

Supporting H3-5, social motives were strongly positively linked to drinking frequency, enhancement motives were strongly positively linked

to the frequency of drunkenness and conformity motives were negatively associated with both alcohol outcomes.

There were also some findings that were not anticipated. One example was that social motives were more closely linked to drunkenness than were coping motives, which was found particularly among young adolescents. In this age group, drunkenness may be more common among those who tend to drink at social gatherings, celebrations and parties (Kuntsche & Müller, 2012). Concerning cross-national differences, it seems that effects of enhancement and conformity motives are more pronounced and those of social motives are less pronounced among younger adolescents (aged 11-13) in northern Europe than in southern Europe, whereas the opposite is the case for older adolescents (those aged 17-19). This indicates that at least some of the cross-national differences in alcohol use were mediated by differences in motives.

## Drinking Motives even Mediate Cultural Aspects

This hypothesis was investigated in detail in the third study on which this chapter is based (Kuntsche, Wicki, Windlin, Nic Gabhainn, Roberts, Vieno et al., 2015). Although many European countries have become more similar in their rates of excessive drinking among adolescents (Kuntsche, Kuntsche, Knibbe, Simons-Morton, Farhat, Hublet et al., 2011), drinking cultures differ between northern Europe, where traditionally excessive drinking on particular occasions is considered more socially acceptable, and southern European wine-producing countries, where the common drinking pattern consists of drinking moderate amounts of alcohol frequently, often accompanying meals (Kuntsche, Rehm, & Gmel, 2004; Room, 2001; Kuendig, Plant, Plant, Miller, Kuntsche, & Gmel, 2008). In addition, differences in country-specific alcohol policies may also be partly responsible for cross-national differences in drunkenness among young people (Gilligan, Kuntsche, &

Gmel, 2012; Bendtsen, Damsgaard, Huckle, Casswell, Kuntsche, Arnold et al., 2014).

However, the basic question emerges as to whether such differences in drinking culture directly account for variations in youth alcohol use or whether the relationships reported above are mediated by drinking motives. The latter is plausible to assume because drinking motives constitute a final pathway towards alcohol use (Cox, Klinger, 1988, 1990; Kuntsche, Knibbe, Gmel, & Engels, 2005) i.e. the gateway through which a variety of more distal factors are mediated (for details, please refer to the next chapter). Thus, based on the same sample of 33,813 alcohol-using adolescents from 13 countries as the previous study on which this chapter is based (Kuntsche, Nic Gabhainn, Roberts, Windlin, Vieno, Bendtsen et al., 2014), the Kuntsche et al. (2015) study investigated whether adolescents from countries in northern Europe differ in their drinking motivations from their counterparts in southern/central European countries and whether the link between drinking culture (northern vs. southern/central Europe) and alcohol use is mediated by drinking motives.

The results showed that, consistent with previous studies (Kuntsche, Rehm, & Gmel, 2004; Room, 2001; Kuendig, Plant, Plant, Miller, Kuntsche, & Gmel, 2008), adolescents from southern European countries drank more frequently but those from northern Europe were drunk more often. In the different age groups and for both alcohol use variables, a small but consistent positive indirect effect via drinking motives was found. It seems that the youth in northern Europe does not drink less frequently than the youth from more southern countries because they would be less motivated (in fact they endorsed all motive dimensions even more strongly). Instead, their drinking appears to be influenced by cultural or country-specific characteristics. The stricter alcohol policies in northern European countries (Gilligan, Kuntsche, Gmel, 2012; Bendtsen, Damsgaard, Huckle, Casswell, Kuntsche, Arnold et al., 2014) and the traditional drinking culture in which frequent moderate drinking is less common (Room, 2001; Kuendig, Plant, Plant, Miller, Kuntsche, & Gmel,

2008) are likely to result in fewer opportunities for consuming alcohol for adolescents in these countries than their counterparts from central and southern Europe. It also seems likely that this occurs independently from the individual motivation to drink.

In contrast, differences in the frequency of drunkenness was found to be due to higher levels of drinking motives among youth from northern Europe their southern/central European counterparts. Interestingly, this mediation was stronger in the two younger age groups (aged in total 11 to 16) and for positive reinforcement motives (social and enhancement) than among older adolescents and for negative reinforcement motives (coping and conformity). It may be the case that drinking to maximize fun with friends at parties has the potential to explain the difference in frequency of drunkenness among underage drinkers living in northern versus southern Europe.

## Assumption 2

# Since Drinking Motives are Proximal Predictors of Alcohol Use They Can Be Used to Better Target Intervention Approaches [2]

[2] This chapter is based on

Kuntsche, E., Wiers, R. W., Janssen, T., & Gmel, G. (2010). Same wording, distinct concepts? Testing differences of expectancies and motives in a mediation model of alcohol outcomes. *Experimental and Clinical Psychopharmacology, 18*(5), 436-444.

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.

Müller, S. & Kuntsche, E. (2011). Do the Drinking Motives of Adolescents Mediate the Link Between Their Parents' Drinking Habits and Their Own Alcohol Use? *Journal of Studies on Alcohol and Drugs*, 72(3), 429–437.

Wurdak, M., Kuntsche, E., Kraus, L., & Wolstein, J. (2016). Effectiveness of a brief intervention with and without booster session for adolescents hospitalized due to alcohol intoxication. *Journal of Substance Use, 21*(1), 72-77.

Wurdak, M., Wolstein, J. & Kuntsche, E. (2016). Effectiveness of a drinking-motive-tailored emergency-room intervention among adolescents admitted to hospital due to acute alcohol intoxication – a randomized controlled trial. *Preventive Medicine Reports, 3,* 83-89.

## Drinking Motives as Mediators

Both from the conceptual point of view and in terms of prevention, the factors most proximate to alcohol consumption are of strategic importance (Kuntsche, Knibbe, Gmel & Engels, 2006a). Prevention efforts are not only more likely to easily access these than more distal factors, but they also tend to reflect or incorporate such distal factors related to, for example, personality, social context or culture. Drinking motives are defined as the final decision to drink or not, and therefore thought to be the most proximal factor for engaging in drinking (Cooper, 1994; Cox & Klinger, 1988, 1990). In this way, drinking motives constitute a final pathway to alcohol use, i.e. the gateway through which distal influences are mediated. For prevention, this means that if drinking motives could be modified detrimental alcohol use patterns could be altered directly. Alternatively, drinking motives could be used to identify homogeneous subgroups of drinkers who are motivated by a constellation of particular needs and problems to which the prevention efforts can be specifically targeted (Kuntsche, Knibbe, Engels, & Gmel, 2010).

A basic requirement is the empirical demonstration of drinking motives functioning as mediators, i.e. that factors assumed to be more distal are related to drinking motives that are in turn related to alcohol use patterns. In other words, distal factors should have only an indirect relationship with alcohol-related outcomes via their link to drinking motives and only a weak direct effect once drinking motives are taken into account. In a series of studies, we have demonstrated that this is the case for a variety of distal factors using samples from different countries and age groups.

One prominent candidate for such a mediation are alcohol expectancies, defined as "people's beliefs about what will happen if they (or other people) drink alcohol, whereas motives are the value placed on the particular effects they want to achieve, which motivate them to drink" (Cox & Klinger, 2004, p. 124). In the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 1990) described in detail above in the Introduction, alcohol expectancies are conceptualized to be the direct precursors of

drinking motives. In the past there has indeed been evidence to support the hypothesis that drinking motives mediate the link between alcohol expectancies and alcohol-related outcomes (Catanzaro & Laurent, 2004; Cooper, Frone, Russell, & Mudar, 1995; Cronin, 1997; Diep, Schelleman-Offermans, Kuntsche, De Vries, & Knibbe, 2016; Kuntsche, Knibbe, Gmel, & Engels, 2007; Nagoshi, Nakata, Sasano, & Wood, 1994; Read, Wood, Kahler, Maddock, & Palfai, 2003). Unfortunately, all of these studies used slightly different instruments and item formulations to measure expectancies and motives, which means that the effects of expectancies and those of motives are not strictly comparable.

To overcome this limitation, we used the exact same items in two different formats (Kuntsche, Wiers, Janssen & Gmel, 2010), i.e. an expectancy format (after drinking alcohol I expect X) and a motive format (I drink to achieve X). Based on a national representative sample of 5,779 alcohol-using students in Switzerland (mean age 15.2), the results of a linear structural equation model revealed that there was a significant mediated effect that was often higher than the direct expectancy effect for 10 out of 12 alcohol-related outcomes. For coping, the expectancy effect was close to zero, indicating the strongest mediation. Moreover, estimating reverse mediation, i.e. taking expectancies as mediators in the motive-alcohol outcome association, resulted in much weaker indirect effects which mostly were insignificant despite the large sample size.

Other distal factors included in the Motivational Model of Alcohol Use (Cox & Klinger ,1988, 1990) concern individual differences in personality, sociocultural and environmental factors. For all these aspects, we provided empirical evidence that drinking motives function as mediators. For example, using a sample of 2,090 university students in Switzerland (mean age 23.5, SD = 2.9), we demonstrated that drinking motives mediate the association between personality factors and alcohol use (Kuntsche, Von Fischer & Gmel, 2008). More specifically, there was a positive link between extraversion and drinking for enhancement motives; a negative link between conscientiousness and both enhancement and coping motives; and a positive link between

neuroticism and drinking to cope. The link between extraversion and alcohol use was mediated by enhancement motives, whereas the negative association between conscientiousness and alcohol consumption was partially mediated by both coping and enhancement motives (Kuntsche, Von Fischer, & Gmel, 2008).

In another study (Lammers, Kuntsche, Engels, Wiers, & Kleinjan, 2013), we used a sample of 3,053 alcohol-using 13- to 15-year old students in the Netherlands to test the mediation of drinking motives within the link between personality traits (negative thinking, anxiety sensitivity, impulsivity, and sensation seeking) and alcohol outcomes (frequency, binge drinking, and alcohol-related problems). The results showed that coping motives, social motives and enhancement motives mediated the link between these personality traits and the alcohol outcomes. Concerning gender differences, enhancement motives were found to play a more prominent mediating role among boys, whereas among girls this was the case for coping motives (Lammers, Kuntsche, Engels, Wiers, & Kleinjan, 2013).

Concerning the sociocultural environment, drinking motives were not only found to mediate the impact of the broader cultural context (Kuntsche, Wicki, Windlin, Nic Gabhainn, Roberts, Vieno et al., 2015) as described in detail above in Assumption 1, they also mediate features of the more proximal social environment such as parental drinking habits which we investigated in two studies. First, using a nationally representative sample of 1,854 alcohol-using 13- to 15-year-old students in Switzerland, we demonstrated that once drinking motives were included, the previously significant association between the parents' alcohol consumption habits and their adolescent children's drinking frequencies was reduced and was no longer significant for drunkenness (Müller & Kuntsche, 2011). Thus, parental drinking habits indirectly affected adolescent alcohol consumption by increasing the level of drinking motives. In particular, enhancement, social and coping motives were prominent mediators in the association between parental drinking and adolescent drinking frequency, while only coping and enhancement

motives played a key role in the association between parental drinking and adolescent drunkenness (Müller & Kuntsche, 2011).

In a second study, we used a prospective design, in which 587 children in Belgium were followed over nine years (Van Damme, Maes, Kuntsche, Crutzen, De Clercq, Van Lippevelde, & Hublet, 2015). Parental drinking was assessed when their children were aged between 10 and 11 and the offspring's drinking motives and habits were documented in early adulthood (age 18 and 19). The results revealed a small but significant direct effect of maternal drinking when the children were 10 or 11 on offspring's alcohol use nine years later. This was not the case for paternal drinking. Nevertheless, paternal drinking indirectly affected offspring's alcohol use (both girls and boys) through a higher level of offspring's enhancement motives and maternal drinking indirectly affected offspring's alcohol use (only boys) through offspring's social motives (Van Damme, Maes, Kuntsche, Crutzen, De Clercq, Van Lippevelde, & Hublet, 2015). Taken both studies together, it appears that drinking motives have a strong role to play in the intergenerational transmission of alcohol use in a way that parental drinking habits shape their offspring's drinking motives, which are in turn closely related to their alcohol consumption patterns.

Over and above expectancies, personality traits and aspects of the sociocultural environment, studies have demonstrated that drinking motives serve as mediators for many other distal factors such as difficulties in emotion regulation (Aurora & Klanecky, 2016; Dvorak, Kuvaas, Lamis, Pearson, & Stevenson, 2015), suicidal thoughts (Gonzalez, Collins, & Bradizza, 2009), social anxiety (Terlecki & Buckner, 2015; Villarosa, Madson, Zeigler-Hill, Noble, & Mohn, 2014), alexithymia (i.e. the inability to identify and describe emotions in the self; Bruce, Curren, & Williams, 2012), mind-body awareness (Leigh & Neighbors, 2009), religiousness and spirituality (Drerup, Johnson, & Bindl, 2011; Johnson, Sheets, & Kristeller, 2008), bullying behaviors and victimization (Archimi & Kuntsche, 2014; Topper, Castellanos-Ryan, Mackie, & Conrod, 2011), sexual assault and coercion (Lindgren, Neighbors, Blayney, Mullins, &

Kaysen, 2012; Fossos, Kaysen, Neighbors, Lindgren, & Hove, 2011), and genetic characteristics (Hendershot, Witkiewitz, George, Wall, Otto, Liang, & Larimer, 2011). All these aspects clearly demonstrate that drinking motives are not only assumed but also empirically function as proximal predictors for alcohol use; they constitute a final pathway to drinking patterns.

## Importance of Drinking Motives in Intervention

Prevention specialists argue that to be effective intervention programs should take into account the particular needs and problems of the individual (Conrod, Stewart, Comeau, & Maclean, 2006; Gorman, 2001; Swaim, 2003). There is very little evidence that intervention programs are effective when applied universally (Masterman & Kelly, 2003). Gorman (2001) stated that "we are likely to need to develop specific types of interventions for specific subgroups of individuals, that is, we need to move from universal interventions to targeted interventions" (p. 351). In other words, prevention programs should be particularly effective if they are designed for and targeted at homogenous risk groups of adolescents with a particular profile of needs and problems (Swaim, 2003). When it comes to risky drinking, the different needs and problems of adolescents are likely to find expression in their motivation to drink (Cooper, Frone, Russell, & Mudar, 1995). Kuntsche and Gmel (2004), for example, identified two groups of risky drinking adolescents, i.e. those who were socially inhibited, depressive, and often victims of bullying, and those who were socially accepted but prone to violence.

To enable identifying and classifying adolescents engaging in risky drinking according to their motivation to engage in drinking as expressed by their drinking motive scores, we developed and validated a coding procedure that provided two groups labeled as "enhancement drinkers" and "coping drinkers" (Kuntsche, Knibbe, Engels, & Gmel, 2010). This study also revealed that enhancement and coping drinkers differ in

various other aspects such as demographics, school and leisure time variables, social relationships, and drinking contexts besides their motivational differences to engage in drinking. Apparently, among risky drinkers, one group (enhancement drinkers) drinks to have fun, to enjoy parties better, and to get drunk, and they also tend to have more drinking peers, better social relationships, and go out more frequently in the evenings. The second group consists of coping drinkers who drink to alleviate problems and worries and not to be rejected by others. They are likely to have less satisfying social relationships, and often drink at home. Due to these differences, we argue that enhancement and coping drinkers should be targeted by specific prevention programs that take into account their needs and problems (Kuntsche, Knibbe, Engels, & Gmel, 2010; Kuntsche, 2013).

Based on a sample recruited in eight German cities between December 2011 and May 2012, we developed and tested the effectiveness of a drinking-motive-tailored intervention for adolescents hospitalized due to alcohol intoxication against a similar non-motive-tailored intervention (Wurdak, Wolstein, & Kuntsche, 2016). Designing and implementing such interventions are important because acute alcohol intoxication is likely to result in injuries, hypothermia, hypoglycemia, and coma (Lamminpää, 1995) and constitutes a major risk of adverse psychological, social, and physical health consequences, such as academic failure, unplanned pregnancy, sexually transmitted diseases, accidents, violence, and suicide attempts (Gmel, Kuntsche & Rehm, 2003). Nevertheless, the number of adolescents admitted to hospital due to an alcohol intoxication has risen in many European countries in the last two decades (e.g. in Croatia: Bitunjac & Saraga, 2009; the Netherlands: Bouthoorn, van Hoof, & van der Lely, 2011; Slovak Republic: Kuzelova, Hararova, Ondriasova, Wawurch, Friedel, Benedekova et al., 2009). In 2013, for example, 23,267 10- to 19-year-olds were treated in hospital in Germany because of alcohol intoxication (Statistisches Bundesamt Deutschland, 2015). Compared to the year 2004, this represents an increase of more than 40%.

The admittance of intoxicated adolescents to emergency rooms can be considered a 'window of opportunity' for delivering interventions the next day. Research from the USA has shown that adolescents and young adults reported less risky drinking and fewer alcohol-related problems after participating in a motivational interviewing (MI) intervention than those with standard care (general medical practice, provision of handouts, brief feedback etc.: Bernstein, Heeren, Edward, Dorfman, Bliss, Winter, & Bernstein, 2010; Carey, Scott-Sheldon, Carey & DeMartini, 2007; Monti, Colby, Barnett, Spirito, Rohsenow, Myers et al., 1999). For example, 13 to 17-year-olds admitted to the emergency department due to an acute alcohol intoxication reduced their heavy episodic drinking (HED) at follow up after participating in a MI intervention (Spirito, Monti, Barnett, Colby, Sindelar, Rohsenow et al., 2004). In another study, this was also case for young adults (Monti, Barnett, Colby, Gwaltney, Spirito, Rohsenow, & Woolard, 2007).

In Germany, the most widely implemented emergency room intervention subsequent to acute alcohol intoxications of young people is "HaLT" (Hart am Limit). The morning after admission and in addition to standard medical care, a social worker delivers a psychosocial intervention (including MI strategies such as strengthening participants' motivation to change their drinking habits in an accepting and person-focused way) to motivate the participants to reduce their risky drinking. Moreover, information on detrimental effects of alcohol is provided and the circumstances which led to the intoxication on the previous day are discussed (Stolle, Sack, & Thomasius, 2009; Stürmer & Wolstein, 2011). Furthermore, the adolescents are invited to take part in a group activity. In this context, the adolescents are also asked to disclose their drinking motives and to reflect on different possibilities of how to drink more responsibly in future.

In a first study, we investigated whether reflecting on drinking motives in the context this group activity (i.e. participation in a 'booster session') subsequent to discharge from hospital has an impact on participants' drinking behavior at follow up compared with participation exclusively in

the HaLT intervention (Wurdak, Kuntsche, Kraus, & Wolstein, 2016). From October 2008 to January 2010 (at hospital admission: t1) and 11 to 25 months later (M = 16.4 months; t2), 106 13- to 17-year olds (at baseline) completed a questionnaire. The results show that adolescents who participated in HaLT and the booster session did not increase HED over time (t1: M = 1.68 HED days; t2: M = 1.59 HED days). This was not the case among those who participated exclusively in the HaLT intervention, for whom the HED frequency more than doubled over time (t1: M = 1.08 HED days; t2: M = 2.66 HED days; $F = 4.383$, $p < 0.05$). It appears that the commonly occurring increase in HED from mid to late adolescence (Inchley, Currie, Young, Samdal, Torsheim, Augustson et al., 2016; Kuntsche & Gmel, 2013) was prevented among adolescents admitted to hospital due to an acute alcohol intoxication and the participation in both the HaLT MI-based intervention and in a group activity in which their drinking motives and more responsible future drinking was discussed. However, this was not observed not when participating in the HaLT standard intervention alone (Wurdak, Kuntsche, Kraus, & Wolstein, 2016). Unfortunately, it remains unclear to what degree the preventive effect that was found can be attributed to the discussion of the participants' drinking motives and according changes towards intentions to drink more responsibly in the future rather than other elements of the of the group activity ('booster session') or its interaction or synergy with the HaLT standard intervention.

Therefore, in a second study, we focused more explicitly on drinking motives (Wurdak, Wolstein, & Kuntsche, 2016). In this instance, however, we used drinking motives to improve the targeting of the intervention's content to the needs and problems of adolescents who engage in risky drinking. These tend to be expressed in their motivation for alcohol use (Kuntsche, Knibbe, Engels, & Gmel, 2010). In a previous study, we argued that "it might be more effective if enhancement and coping drinkers were targeted by distinct prevention programs that take into account their specific needs and problems" (Kuntsche & Cooper, 2010, p. 52). For example, relaxation techniques to reduce stress levels are likely to be

particularly beneficial for coping drinkers who per definition drink to alleviate tension and to forget about problems.

In previous work, we identified and described the two groups that differed fundamentally in positive and negative reinforcing effects of alcohol and associated factors (Kuntsche, Knibbe, Gmel, & Engels, 2006b; Kuntsche, Knibbe, Engels, & Gmel, 2010). Enhancement motivated drinkers are likely to be male and to enjoy the feeling of getting drunk, often in conjunction with personality traits such as impulsivity, extraversion, or sensation-seeking. Additionally, also scoring high on social motives, enhancement drinkers often drink together with their peers and significant others. In contrast, coping motivated drinkers are likely to be female and to show high levels of introversion and anxiousness. They are likely to consume alcohol on their own to alleviate or forget about their problems and worries. Moreover, also scoring high on conformity motives, they tend to consume alcohol to be liked or accepted by others or gain access to peer groups (Kuntsche, Knibbe, Gmel, & Engels, 2006b; Kuntsche, Knibbe, Engels, & Gmel, 2010).

For the second intervention study (Wurdak, Wolstein, & Kuntsche, 2016), based on the scores obtained from the drinking motive questionnaire revised short form (DMQ-R SF: Kuntsche & Kuntsche, 2009), we developed a classification algorithm for allocating the participating adolescents to one of the six groups. The following combinations of motives were used for the identification and classification: 'pure' coping drinkers (low conformity motives), 'pure' enhancement drinkers (low social motives), drinkers with coping and conformity motives, drinkers with enhancement and social motives, drinkers scoring high on both coping and enhancement motives, and those scoring low on these motives.

In addition to the HaLT standard intervention, adolescents from the intervention group (IG) were offered a series of motive-tailored exercises designed to provide alternatives in fulfilling the particular emotional needs concerning the six motive groups. For example, coping drinkers

were shown alternative ways of dealing with stress and problems and were taught about relaxation methods. Enhancement and social drinkers, in contrast, received exercises relating to productive ways of spending their leisure time, alternative sensation-seeking activities and how to deal with peer pressure. In total, we developed 27 ten-minutes exercises, which were based, e.g., on interpersonal skills training, protective behavioral strategies and stress reduction techniques. All exercises contained education materials but also interactive parts. Audio files and video clips were used to make the exercises attractive and to catch the participating adolescents' attention. Participants in the control group (CG) received exercises dealing with general alcohol-related information such as the effects of alcohol intoxication or legal age purchase restriction as an add-on to the HaLT psychosocial intervention. Using a tablet computer, specially trained social workers conducted the intervention in the hospital for both the IG and CG. In addition, the adolescents were invited to complete further exercises at home.

Among girls and boys in both the CG and IG, the results revealed a reduction in alcohol consumption (Wurdak, Wolstein, & Kuntsche, 2016). It appears that experiencing hospitalization due to an alcohol intoxication and participating in any psychosocial intervention prevented frequent risky drinking in the subsequent weeks. In addition to this general intervention effect, girls who received the intervention motive-tailored indicated less frequent drinking and a lower binge drinking frequency at follow-up than girls who received the similar psychosocial intervention but not motive-tailored. Unfortunately, no such difference was found among boys, i.e. their alcohol consumption reduction at follow-up was independent of whether they received intervention in a motive-tailored way or not. One explanation may be that girls, being more conscientious than boys in general, completed the exercises more thoroughly and thus took more profit out of the motive-targeted content. Another explanation can be seen in the circumstance that the alcohol consumption of girls is affected to a greater extent by internal factors including personal motivation whereas among boys it is affected to a greater extent by

external factors, such as the social company when drinking (Koordeman, Kuntsche, Anschutz, van Baaren, & Engels, 2011; Thrul & Kuntsche, 2015).

Conclusively, the second study, which explicitly included drinking motives, revealed that a greater reduction of alcohol use among girls can be observed when an intervention takes into account the needs and problems as expressed by their drinking motives than when participating in a non-motive-tailored intervention. Future research should investigate possibilities to improve tailoring interventions to the needs of boys who engage in risky drinking, since they apparently did not profit from the conducted motive-tailored intervention to the same extent as girls did.

## Assumption 3

# Considerations of the Motivational Model of Alcohol Use can be Transferred to Other Domains of Young People's Functioning [3]

[3] This chapter is based on

Bischof-Kastner, C., Kuntsche, E. & Wolstein, J. (2014). Identifying problematic internet users: Development and validation of the Internet Motive Questionnaire for Adolescents (IMQ-A). *Journal of Medical Internet Research, 16*(10), e230.

Kuntsche, E., Le Mével, L. & Berson, I. (2016). Development of the four-dimensional Motives for Listening to Music Questionnaire (MLMQ) and associations with health and social issues among adolescents. *Psychology of Music, 44*(2), 219-233.

Jonker, A. & Kuntsche, E. (2014). Could music potentially serve as functional alternative to alcohol consumption? The importance of music motives among drinking and non-drinking adolescents. *Journal of Behavioral Addictions, 3*(4), 223-230.

Thurn, D., Kuntsche, E., Weber, J. & Wolstein, J. (2017). Development and initial validation of the Amphetamine-type stimulants Motive Questionnaire (AMQ) in a clinical population. *Frontiers in Psychiatry, 8, 183.*

## Universality of the Motivational Model

As mentioned above in the Introduction, despite being applied exclusively to alcohol, the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 2004) incorporates aspects of general human functioning and offers a comprehensive theory for explaining human behavior. Goal pursuit initiated by the affective change that individuals expect from achieving the goal is at the core of the model. In general, people strive for conditions that will make them feel better, either by increasing pleasure or by relieving discomfort, i.e. they are motivated by positive incentives to improve their positive moods or by negative incentives to alleviate negative moods. Moreover, this can happen either in a direct way or rather instrumentally, e.g. through the social context. Taken together, the pursuit of an affective change represents a basic condition for human goal pursuit (Klinger & Cox, 2004).

## Motives for Internet Use

Due to their universality the assumptions made in the Motivational Model of Alcohol Use can be transferred to other domains of human functioning. In previous studies this was already shown to be the case for gambling (Stewart & Zack, 2008) and sexual risk-taking behavior (Cooper, Shapiro & Powers, 1998). Another domain that is omnipresent in the lives of young people is the use of the Internet. Due to the proliferation of smartphones, tablet computers and other handheld or portable devices, of hotspots and the coverage of wireless networks young people today can access the Internet almost everywhere and at any time. The Internet is a convenient source of information, education, entertainment, social contacts, shopping, and recreational activities. Some people even visit the Internet to such a frequent and compulsory degree that Internet addiction has been included as new mental disorder in the DSM 5 (American Psychiatric Association, 2013).

Previous attempts to classify motives for media use included the four basic motive categories: information, personal identity, integration and social identity, and entertainment (McQuail, 2010). Although the according instruments were not developed based on a comprehensive motivational theory some similarities to the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 2004) can be found. In the following, we use the considerations of this model more explicitly to develop the Internet Motive Questionnaire for Adolescents (IMQ-A: Bischof-Kastner, Kuntsche, & Wolstein, 2014) and we validate it in a sample of 101 adolescents in Germany (52.5% female; mean age: 15.9 years).

The results revealed an acceptable, but not outstanding fit of the specified four-factor model of motives for Internet use (Bischof-Kastner, Kuntsche, & Wolstein, 2014). It appears that despite substantial similarities between Internet motives and drinking motives, some items (e.g. "because your friends pressurized you to do it") were formulated too strongly for the context of Internet use. Nevertheless, all the other items showed significant loadings on the factors to which they belong and there was also an at least satisfactory internal consistency for all four dimensions (Nunnally & Bernstein, 1994). Moreover, results obtained from the regression analyses provided empirical support the concurrent validity of the IMQ-A. Consistent with the literature on gambling motives (Stewart & Zack, 2008) and drinking motives (Cooper, Kuntsche, Levitt, Barber & Wolf, 2016; Kuntsche, Knibbe, Gmel & Engels, 2005) enhancement and coping were associated with dysfunctional Internet use. It appears that participants used the Internet (as is the case with alcohol consumption or gambling in previous research) to regulate their emotions (Bischof-Kastner, Kuntsche, & Wolstein, 2014). Taken together, the IMQ-A appears to be a valid and reliable instrument to measure motives for Internet use in adolescent populations and may help to identify dysfunctional Internet users for which intervention approaches are warranted.

## Motives for Listening to Music

Like Internet use, music is not only omnipresent in the lives of young people but can also be used to obtain a desired emotional change, e.g. to get into a party mood or to cheer up when sad (Kuntsche, Le Mével & Berson, 2016; Jonker & Kuntsche, 2014). Lonsdale and North (2011) even demonstrated that the emotional function of music is often more important for young people than its functions for identity formation and social contacts. Other authors argued that investigating motives for listening to music from a mood regulation perspective leads to a better understanding of adolescent psychological functioning and mental health (Miranda, 2013; Miranda & Claes, 2009; Ruud, 1997).

As with Internet use described above, we argued that the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 2004) can be adapted to study motives for listening to music. Interestingly, a variety of previous studies used items or instruments to assess motives for listening to music that are consistent with the four categories obtained by crossing the two dimensions 'valence' (positive vs. negative reinforcement) and 'source' (internal vs. external) as assumed by the Motivational Model (see Kuntsche, Le Mével & Berson, 2016, for an overview). Adapting items from the Short Form of the Drinking Motive Questionnaire Revised (DMQ-R SF: Kuntsche & Kuntsche, 2009), we develop the four-dimensional Motives for Listening to Music Questionnaire (MLMQ) and validated it based on a nationally representative sample of 4,524 12 to 18-years-old students in Switzerland (mean age = 14.5, 48.9% boys).

The results showed high internal consistencies and a good fit of the specified four-factor model for music motives, which was even higher than that of the IMQ-A. Interestingly, the social and enhancement motive dimensions showed the highest inter-factor correlation, which is consistent with results on drinking motives (Cooper, 1994; Kuntsche, Knibbe, Gmel, & Engels, 2005; Kuntsche & Kuntsche, 2009). Concerning

concurrent validity of the MLMQ, coping motives were not only associated with a wide range of health indicators but also with being a victim of bullying and having to face school pressure. Listening to music seems to be a way for young people to compensate negative experiences, to cope with worries and problems and to alleviate bad moods. In contrast, social motives were associated with frequent peer activities such as spending evenings out with friends and grouping together to bully others. The results show that those who listen for enhancement motives indicated a higher life satisfaction but did not spend many evenings with peers. This aligns with the definition of enhancement motives (Cox & Klinger, 1988, 1990), i.e. increasing positive mood internally, not necessarily in a social context.

In another study, we tested the importance of music motives for health-related outcomes among alcohol using adolescents when drinking motives were taken into account (Jonker & Kuntsche, 2014). The results revealed that almost all links between music motives and health-related outcomes remained significant when drinking motives were jointly included in a regression model. This further underlines the importance of music in adolescence, e.g. in respect to identity formation, peer affiliation, and regulating emotions (Laiho, 2004). Apparently, music serves important functions in the lives of young people, even for those who consume alcohol for different motives. These results also have important implications for health promotion. For example, it may be promising to coach adolescents to relieve stress and to cheer up when in a bad mood by listening to music. In addition adolescents can be coached to have more fun with peers instead of using the psychoactive properties of alcohol or other substances for those purposes. Besides targeting specific drinking motives as described in detail above in Assumption 2, health promotion and intervention attempts should therefore consider promoting music as a functional alternative to alcohol use (Jonker & Kuntsche, 2014). This is particularly important since listening to music usually has fewer negative consequences compared to excessive alcohol consumption (Gmel, Rehm, & Kuntsche, 2003).

## Motives for Amphetamine-Type Stimulants

From the evidence included in this chapter so far it is obvious that the four-dimensional classification of motives according to the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 1990) can be transferred to other domains of young people's functioning, such as using the Internet and listening to music. What remains to be demonstrated is whether this classification of motives also holds true in a clinical population and for the use of illegal substances such as amphetamine-type stimulants (ATS).

Comprising psychoactive substances such as Crystal Meth, Speed, and Ecstasy, ATS have a high potential for dependency and are likely to lead to multiple somatic and mental consequences such as cardiovascular and cerebrovascular diseases, different types of infections, depression and psychosis (Hoffmann, Schumann, Fankhaenel, Thiel, Klement, & Richte, 2016; Hart, Marvin, Silver & Smith, 2012; Petit, Karila, Chalmin & Lejoyeux, 2012; Plüddemann, Flisher, McKetin, Parry & Lombard, 2010). Despite various attempts to measure and classify motives for ATS use (e.g. Micoulaud-Franchi, MacGregor & Fond, 2014; Kerley, Copes & Griffin, 2015), to date no instrument exists to assess ATS motives in a theory-driven, valid and reliable way which is essential to generate targeted preventive and therapeutic treatments.

Consistent with the IMQ-A and the MLMQ described above, we used the DMQ-R SF (Kuntsche & Kuntsche, 2009) as the basis for the development of the Amphetamine-type stimulant Motive Questionnaire (AMQ: Thurn, Kuntsche, Weber, & Wolstein, 2017). For the validity of the AMQ, we investigated three aspects: (1) construct validity evidenced by a good fit of the assumed four-factor structure of the AMQ and high factor loadings of the corresponding items, and at least satisfactory internal consistencies (Allen & Yen, 2002; Nunnally & Bernstein, 1994); (2) the equivalence of the AMQ four-dimensional factor structure among subgroups (gender and age); (3) mean differences in the subgroups gender and age in the four factors.

Data came from individuals addicted to ATS who were inpatients in hospital based drug treatment programs or outpatients at drug counseling centers in Bavaria (South-East Germany). In total, eleven drug-counselling centers, as well as the addiction and forensic departments of three regional psychiatric hospitals participated in the study. The analyses were based on the answers of 233 primarily ATS addicted patients of whom 74.2% were male. The mean age was 31.1 (SD = 7.9; age range 18 - 54).

The confirmatory factor analysis demonstrated the goodness fit of the theoretically assumed four-factor model to the empirical data (Thurn, Kuntsche, Weber, & Wolstein, 2017). There were also highly significant factor loadings ranging from $\lambda = .48$ to $\lambda = .95$. Nested models of confirmatory factor analyses with increasing degrees of freedom provided evidence for the configural invariance across gender and age subgroups. The mean difference test revealed that men scored somewhat higher on positive reinforcement (enhancement and social motives) and women scored somewhat higher on negative reinforcement (coping and conformity motives). However, the difference was statistically significant only for enhancement motives. There were no age differences in any of the four motive dimensions.

The results clearly indicate that the four-dimensional classification of motives as assumed by considerations of the Motivational Model of Alcohol Use (Cox & Klinger, 1988, 1990) also hold true for the use of illegal substances such as ATS and in a clinical population (Thurn, Kuntsche, Weber, & Wolstein, 2017). What remains to be demonstrated in future research is the concurrent validity of the AMQ. This was not possible in the present study due to the lack of suitable outcomes. It would also be interesting to investigate whether the AMQ can be successfully applied in other countries and other clinical settings than the one used in this study.

# Discussion

## General Conclusion and Issues Still to be Solved

Taken together, the 12 empirical studies included here clearly demonstrate that drinking motives (a) are cross-culturally valid, ($b_1$) serve as proximal predictors of alcohol use, i.e. the gateway through which more distal factors such as alcohol expectancies, personality factors and parental drinking habits are mediated, ($b_2$) are useful in intervention approaches to reduce adolescent risky drinking and (c) can be transferred to other domains of human functioning such as using the Internet, listening to music and using amphetamine-type stimulants (ATS). However, much work still needs to be undertaken to come to a more complete picture and even firmer conclusions about usefulness of drinking motives for research and prevention.

Concerning (a), with some notable exceptions (Brazil: Hauck-Filho, Teixeira, & Cooper, 2012; China: Cheng, Phillips, Zhang, & Wang, 2016; Sun, Windle & Thomson, 2015; Sri Lanka: Perera & Torabi, 2009), the overwhelming majority of evidence available today has come from North America and Europe. It remains thus unclear to what degree the results presented here hold true for South America, Africa or Asia, for example. Extending drinking motive research to these areas remains an important task for future studies.

Concerning ($b_1$), most of the studies indicating that drinking motives function as a gateway to alcohol use through which more distal influences are mediated have been conducted using cross-sectional data. A stronger test of the mediating role of drinking motives requires longitudinal data demonstrating that distal factors shape or lead to drinking motives over time which, in turn, shape or lead to risky drinking patterns and other alcohol-related outcomes over time. Such longitudinal evidence is still lacking today. Concerning ($b_2$), we are only beginning to understand the role of drinking motives in intervention approaches. Moreover the studies included here have exclusively dealt with a relatively specific population (i.e. young people admitted to hospital due to alcohol intoxication) and the obtained results are not univocal. For example, it remains unclear why

boys did not profit from the motive-tailored intervention to the same degree as girls did. Future research is needed to investigate ways improve tailoring interventions to the needs of boys who engage in risky drinking.

Concerning (c), it is interesting to see that, besides gambling (Stewart & Zack, 2008) and sexual risk-taking behavior (Cooper, Shapiro & Powers, 1998), the assumptions made in the Motivational Model of Alcohol Use can easily be transferred to other domains of human functioning that are as different as using the Internet, listening to music and using ATS. However, future studies will reveal to what the degree the instrument we developed to measure motives in these areas are useful in research and prevention, i.e. the Internet Motive Questionnaire for Adolescents (IMQ-A: Bischof-Kastner, Kuntsche, & Wolstein, 2014), the Motives for Listening to Music Questionnaire (MLMQ: Kuntsche, Le Mével & Berson, 2016) and the Amphetamine-type stimulant Motive Questionnaire (AMQ: Thurn, Kuntsche, Weber, & Wolstein, 2017).

A more general limitation concerns the fact that all the 12 studies included here and also the large majority of international studies have used samples of (older) adolescents and young adults. Consequently, not much is known about drinking motives and other alcohol-related cognitions in early adolescence and later adulthood, on which future research should thus focus.

## Recommendation for Future Drinking Motive Research in Early Adolescence

Research has shown that alcohol expectancies are strongly transmitted from parents to their 9 to 13-year old children (Donovan, Molina, & Kelly, 2009). As mentioned above in Assumption 2, we found evidence that parental drinking shapes the drinking motives of adolescent children, which, in turn, is associated with adolescent alcohol use (Müller & Kuntsche, 2011; Van Damme, Maes, Kuntsche, Crutzen, De Clercq, Van

Lippevelde, & Hublet, 2015). However, evidence is still lacking as to whether drinking motives are inter-generationally transferred to the same degree and in the same way as expectancies (Donovan, Molina, & Kelly, 2009). Clarifying this question is of crucial importance in explaining underage drinking since, as mentioned above in Introduction and in Assumption 2, motives are conceptualized and were found to be among the most proximal predictor, the factor through which the effects of expectancies were mediated (Kuntsche, Knibbe, Gmel, Engels, 2007; Kuntsche, Wiers, Janssen & Gmel, 2010). Thus, it appears important for future research to provide empirical evidence for the question to what degree alcohol cognitions in late childhood and early adolescence are shaped by parental alcohol cognitions, i.e. transferred across generations.

Another important issue for future research is the question whether drinking motives not only mediate the relationship between expectancies and alcohol use cross-sectionally (as demonstrated above in Assumption 2) but also in the transition from childhood to adolescence. Providing empirical evidence to this question appears particularly important in early adolescence when the step from consideration (alcohol expectancies) to action (first alcohol consumption) is commonly made. Numerous studies have shown that expectancies in early adolescence predict the first use of alcohol and drinking levels in later life (Windle, Spear, Fuligni, Angold, Brown, Pine et al., 2008; Donovan, Molina, & Kelly, 2009). However, as mentioned in the Introduction and in Assumption 2, Cox and Klinger (1988, 1990) argue in their Motivational Model of Alcohol Use that drinking motives are the final step towards alcohol use, while expectancies influence alcohol consumption only insofar as they shape specific drinking motives. Unfortunately, research in this area suffers from two major limitations. First, all previous studies investigated the mediational model among older adolescents or young adults whose drinking habits are already established, and not among individuals in early adolescence, the time when the transformation of expectancies into motives is assumed to occur (Kuntsche, 2007). Second, previous studies used cross-sectional data, which render the test of causality in the expectancy-motive-alcohol

consumption link impossible. Therefore, using longitudinal data, it remains an important task to clarify whether, in the transition from childhood to adolescence, alcohol expectancies causally lead to drinking motives and not vice versa and whether motives mediate the link between expectancy and first drinking.

With this comes the question of what kind of motives early adolescents indicate for their first alcohol consumption and how these motives subsequently develop in a period in which young adolescents usually gain more and more experiences both with the direct psychoactive and instrumental (social) effects of alcohol. In earlier work, we argued that young adolescents drink for the first time for conformity motives, i.e. to fit in with a group, situation or event, e.g. birthday or New Year's Eve celebrations (Kuntsche, 2007). One of our literature reviews revealed that once drinking is initiated, there appears to be a developmental sequence towards more complex drinking motive patterns (Kuntsche, Knibbe, Gmel, & Engels, 2006b), particularly due to the increase in social, enhancement, and coping motives (Cooper, 1994; Kuntsche & Kuntsche, 2009). Unfortunately, empirical evidence on the progression of drinking motive development early in life is still lacking but would be an important task for future drinking motive research.

## Recommendation for Future Drinking Motive Research in Adult Populations

While most studies to date were conducted among adolescents and young adults, an increasing number of studies have emerged in the last decade that investigate drinking motives in adult samples. In the absence of alternative, theory-based instruments for adults (aged over 24), the majority of these studies used the Drinking Motive Questionnaire Revised (DMQ-R: Cooper, 1994), originally developed for adolescents, to investigate drinking motives in adulthood (e.g. Cheng, Phillips, Zhang, &

Wang, 2016; Crutzen & Kuntsche, 2013; Németh, Urbán, Kuntsche, Moreno San Pedro, Gil Roales Nieto, Farkas et al., 2011).

The use of the DMQ-R to study adult drinking motives and its link to adult alcohol use is problematic because not only are the personal importance and endorsement of the same motives likely to change as individuals grow older (Crutzen, Kuntsche & Schelleman-Offermans, 2013; Schelleman-Offermans, Kuntsche & Knibbe, 2011) but also the kind and content of the drinking motives. Consequently, motives endorsed in early adulthood may no longer be important later in life and may be replaced by an entirely new set of drinking motives. Although several studies also confirmed the four-factor structure of the DMQ-R in adult samples (Cheng, Phillips, Zhang, & Wang, 2016; Crutzen & Kuntsche, 2013), the endorsement of conformity motive items included in the DMQ-R such as “so that others won’t kid you about not drinking” or “to fit in with a peer group you like” was extremely low. This indicates that the items used to measure this motive category are no longer important for the majority of adults.

However, this does not imply that adults no longer drink for conformity motives. Qualitative studies indicate that conformity motives such as drinking “because it is customary for men on special occasions” or “not to look square at a party” are also relevant to adult alcohol use (Collins, Carey, & Otto, 2009; Emslie, Hunt, & Lyons, 2012; Perera & Torabi, 2009). In addition, the formulation of some of the motive items in the DMQ-R (e.g. "because it is fun" or "so that others won't kid you about not drinking") appears less appropriate for adult drinking habits, and that other potentially relevant motives, e.g. enhancement motives such as “I enjoy the taste of wine” (Collins, Carey, & Otto, 2009; Emslie, Hunt, & Lyons, 2012; Perera & Torabi, 2009) exist but are not included in theory-based instruments such as the the DMQ-R (Cooper, 1994).

Thus, it appears an important task for future research to focus more on the particularities of drinking motives in adulthood. One first step in this direction would be the development and validation of an instrument to measure adults' drinking motives that is not only theory-based but also

uses items of high relevance to the age group over 24. This is also important because more responsibilities and constraints (e.g. profession and family-related) tend to affect alcohol consumption habits as individuals grow older, i.e. most former risky drinkers 'mature out' and adopt more regular but moderate drinking habits later in adulthood. For example, in a literature review, we show that while the proportion of risky single occasion drinkers decreases from age 20 onwards, the proportion of daily drinkers and those with chronic risky alcohol use increases (Kuntsche & Gmel 2013).

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## Curriculum Vitae

Dr. Emmanuel Kuntsche is currently a Senior Researcher at Addiction Switzerland, an NGO located in Lausanne, Switzerland, an Associate Professor of Developmental Psychopathology at the University of Nijmegen (the Netherlands) and a Honorary Professor at the Institute of Psychology, Eötvös Loránd University, Budapest, Hungary. He is also the secretary of the Swiss Foundation for Alcohol Research and has editorial appointments in several leading journals in the field. In the last 5 years, he has published more than 100 articles, book chapters, research reports, and other scientific documents (more than 300 in his carrer so far of which more than 120 are first-authored publications) and contributed to more than 80 scientific meetings (187 in his carrer so far of which 63 were invited presentations). He received career awards from International Kettil Bruun Society for Social and Epidemiological Research on Alcohol, the Netherlands Organisation for Scientific Research (NWO) and the German Society for Addiction Research and Addiction Treatment (DG Sucht).

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This work provides empirical evidence to back up three basic assumptions in contemporary drinking motive research. The first is that the four-dimensional model of drinking motives and links between the motive dimensions and alcohol use hold true among adolescents from different countries. The second states that drinking motives can be used to better target intervention approaches due to the proximity of drinking motives to alcohol-related outcomes. The third assumption deals with the question to what degree considerations of the Motivational Model of Alcohol Use can be transferred to other domains of human functioning.

The 12 empirical studies included here clearly demonstrate that drinking motives (a) are cross-culturally valid, (b1) serve as proximal predictors of alcohol use, i.e. the gateway through which more distal factors such as alcohol expectancies, personality factors and parental drinking habits are mediated, (b2) are useful in intervention approaches to reduce adolescent risky drinking and (c) can be transferred to other domains of human functioning such as using the Internet, listening to music and using amphetamine-type stimulants.




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