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Running Head: Experimental Induction

Experimental induction of adaptive motivation: Proof of concept

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Abstract

Objective: A study was conducted to determine the effectiveness of an experimental procedure for inducing adaptive motivation, including its differential efficacy for light/moderate and heavy drinkers.

Method: Participants were university-student drinkers ($N = 79$, males = 26.1%, mean age = 19.86 years) who were randomly assigned to a control or an experimental group. The experimental group underwent an experimental induction involving Concept Identification Cards for enhancing adaptive motivation, whereas the control group received an inert induction. At baseline, all participants completed a demographics questionnaire and the Alcohol Use Questionnaire. To evaluate the effectiveness of the induction, at both baseline and post-induction, participants completed the General Self-Efficacy Scale and the Task-Specific Personal Concern Inventory (TSPCI).

Results: At baseline, there were no differences between the two groups on Self-Efficacy or Task-Specific Adaptive Motivation. At the post-test, participants in the experimental group correctly answered more of the Concept Identification Cards than the control group ($p < .001$). At the post-test, only the experimental group showed improvements in self-efficacy ($p < .025$) and task-specific adaptive motivation ($p < .025$).

Conclusions: This study demonstrates that adaptive motivational structure can be experimentally induced, and the induction is as effective with Heavy Drinkers as with Light/Moderate Drinkers. Suggestions for future research using the induction of adaptive motivation with heavy drinkers is discussed.

Key words: alcohol consumption, motivational structure, adaptive motivation, Concept Identification Cards, experimental induction, proof of concept

Experimental induction of adaptive motivation with light and heavy drinkers: Proof of concept

Introduction

Many university students drink excessive amounts of alcohol, often in binges, sometimes with economic, physical, psychological, and social consequences (Bagheri & Cox, 2023; Cox et al., 2006; Helle et al., 2022; LaBrie et al., 2009). After they leave university, some heavy-drinking students will mature out of their unhealthy drinking habits, but other heavy-drinking students are the future alcoholics in society. It is important, therefore, to understand students' motivations for heavy drinking and to find ways to motivate them to drink more sensibly.

Our theoretical context for understanding students' motivations for drinking is Cox and Klinger's (1988, 1990, 2004a, 2011a, 2022) motivational model of alcohol use. Research based on the model has identified individuals' motivational structure as an important determinant of their motivation for drinking alcohol. Motivational structure is the nature of the goals that a person chooses to pursue (e.g., whether they are positive or negative and realistic or unrealistic) and the manner in which he or she pursues them. Two basic patterns of goal-striving have been identified that characterize a person's motivational structure: adaptive and maladaptive. This concept was derived from Value X Expectancy theory (Feather, 1982; Klinger & Cox, 2011a; Van Eerde & Thierry, 1996), which holds that there are two essential components of successful goal-strivings. First, to be adequately motivated, individuals must pursue goals that hold value for them; that is, achieving their goals will either increase their positive affect or reduce their negative affect. Secondly, their goal-strivings must have a realistically good chance of succeeding.

In factor analyses of Cox and Klinger's (2004b, 2011b) Motivational Structure Questionnaire (MSQ) and Personal Concerns Inventory (PCI), respondents with adaptive motivation were found to have loadings on both Value and Expectancy, whereas those with

maladaptive motivation had loadings on either value or expectancy, but not on both. On the MSQ and PCI, Value is indicated by loadings on indices such as expected Happiness from successful goal pursuits and Sorrow from unsuccessful goal pursuits. Expectancy is indicated by anticipated success from goal pursuits. Individuals with adaptive motivation might also have loadings on Commitment to their goal pursuits, perceived Control over goal pursuits, and Knowledge about what steps to take to reach their goals successfully. Studies of the motivational structure of university students have found that (a) having an adaptive motivational structure is inversely related to the amount of alcohol that students habitually consume, and (b) university students who have experienced problems as a result of their drinking are better able to control their drinking if they have an adaptive motivational structure (Cox & Klinger, 2002, 2004b, 2011b; Cox, Schippers, Klinger, et al., 2002; Klinger & Cox, 2004b, 2011b).

In view of the important role that adaptive motivation has on individuals' goal pursuits, Shamloo (2007) developed an experimental intervention for enhancing participants' adaptive motivation. Initially, Shamloo (2007; Shamloo & Cox, 2010) found that university students' sense of control and their intrinsic motivation were positively associated with their adaptive motivation but inversely related to the amount of alcohol that they consumed. Shamloo (2007; Shamloo & Cox, 2014) went on to find that the experimental procedure (a) increased participants' sense of control and their adaptive motivation, and (b) decreased their urges to drink alcohol.

The goal of the present study, therefore, was to further evaluate the effectiveness of Shamloo's experimental intervention with university student drinkers. Unlike Shamloo's study (2007; Shamloo & Cox, 2014), the present study also assessed whether the intervention was differentially effective for light/moderate and heavy drinkers.

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Method

Participants

Using G*Power (Erdfelder et al., 1996) and an expected effect size of $f = .30$ with two groups of participants, a required sample size of 79 was calculated. The 79 undergraduate psychology students (males = 26.1%; males' mean age = 21.19 years, $SD = 3.1$; females' mean age = 19.38 years, $SD = 1.08$) were recruited through Bangor University's School of Psychology's Student Participant Panel. The inclusion criterion was to be a consumer of alcohol; however, in order to recruit participants with a variety of levels of drinking, the amount of alcohol that participants should drink was not specified during the recruitment. Recruitment was discontinued when 79 participants who met the inclusion criterion had been tested. Participants were randomly assigned to the Control Group ($N = 39$, 25.6% males) or the Experimental Group ($N = 40$, 27.5% males).

Instruments

At baseline, participants completed the (a) Demographics Information Sheet, which asks respondents for their age, gender, and year of study at the university, and (a) the Alcohol Use Questionnaire (AUQ; Cox, 2000). The AUQ asks respondents about the quantity and frequency of their consumption of various types of alcoholic beverages (beer, wine, spirits, and alcopops) during the prior year. It yields three indices of drinking: (a) usual consumption, (b) unusual consumption (on occasions when more alcohol than the usual amount is consumed), and (c) overall consumption. Overall consumption can be calculated on a weekly, monthly, or yearly basis.

In order to evaluate the effectiveness of the experimental induction, participants were

administered two other instruments at both baseline and post-intervention. The first was the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995). It is a 10-item scale designed to assess self-efficacy, i.e., the belief that one's actions are responsible for successful outcomes. Each item is answered on a 1-to-4 scale, on which higher scores indicate a stronger belief in self-efficacy. The second instrument was the Task-Specific Personal Concerns Inventory (TSPCI).

Task-Specific Personal Concerns Inventory

Shamloo (2007; Shamloo & Cox, 2014) developed a task-specific version of Cox and Klinger's (2004b, 2011b; Klinger & Cox, 2004b, 2011b) Personal Concerns Inventory (PCI) specifically for use in the experimental induction of adaptive motivation. It is called the Task-Specific Personal Concerns Inventory (TSPCI). The baseline version of the TSPCI asks respondents to anticipate their performance on a task involving Concept Identification Cards. On the post-induction version of the TSPCI, participants are asked to complete the TSPCI again, this time based on their actual experience with the task.

Using Likert scales ranging from 0 (*not at all*) to 10 (*the greatest amount*), respondents rated their goal for completing the experimental task. The rating scales are: (a) Appetitive Action (*to get, obtain, or accomplish* as the positive valence of the goal); (b) Aversive Action (*to get rid of, prevent, or avoid* as the negative valence of the goal); (c) Perceived Control (over achieving the goal); (d) Knowledge (about what to do to achieve the goal); (e) Chances of Success (of achieving the goal *if I do my best*); (f) Chances of Success (*if I do nothing*); (g) Happiness (expected from achieving the goal); (h) Conflict (unhappiness from achieving the goal); (i) Sorrow (expected from failure to achieve the goal); (j) Commitment (to achieving the goal); and (k) Goal Distance (i.e., how long it will take to achieve the goal). From the ratings, motivational indices are calculated, and from these, the structure of the respondent's motivation is revealed, viz., the degree to which it is adaptive or maladaptive.

For the Task-Specific PCI, a summary score is calculated for each participant's Task-Specific Adaptive Motivation. The summary score was based on the PCI rating scales that load on the adaptive motivation factor. The rating scales with negative loadings were summed, and the total was then subtracted from the total of the rating scales with positive loadings. This scoring procedure was used in previous studies, including Fadardi and Cox (2009), Fadardi et al. (2011), and Shamloo and Cox (2014).

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Manipulation task

Materials

Computerized Concept Identification Cards (Shamloo, 2007; Shamloo & Cox, 2014) were used to enhance participants' adaptive motivation. The cards are similar to those previously used in studies of learned helplessness (Hiroto & Seligman, 1975; Kofta & Sedek, 1989; Tennen & Eller, 1977). On the computer screen, participants saw a series of cards, each of which contains two geometric patterns that can differ along five dimensions, and each dimension has two possible values. The dimensions of the geometric patterns and the dimensions along which they vary are: *Shape* (Circle or Triangle), *Size of the Shape* (Small or Large), *Surface of the Shape* (Plain or Striped), *Size of the Letter Within the Shape* (Small or Large), and *Position of the Line* (Above the Shape, Below the Shape); see Table 1.

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Procedure

Participants were tested individually in one of the School of Psychology's experimental rooms, where the background noise was minimal. The room was equipped with both a PC and a Macintosh. The experimenter briefly clarified the goals of the study before giving the

participant a study pack. The participant was then ~~asked to read~~ the Information Sheet and to sign the Consent Form, if he or she wanted to continue with the experiment. Next, the participant completed the baseline assessment, which included the (a) Demographics Information Sheet, (b) Alcohol Use Questionnaire, (c) General Self-Efficacy Scale, and (d) Task-Specific Personal Concerns Inventory.

Experimental induction

After the baseline assessment was completed, the experimental task involving the Concept-Identification Cards was administered. The Concept-Identification Cards were presented as slides in PowerPoint to both the Experimental and the Control groups. Shamloo (2007, Shamloo & Cox, 2014) has provided detailed, verbatim instructions that are given to each group of participants; however, the procedure used in the current study can be ~~described~~ as follows:

The cards were combined into pairs based on the following principles: *First*, all pairs of cards had two values in common. *Second*, the same series of cards was presented to both the Experimental Group and the Control Group. Across each set of five pairs of cards presented sequentially, only one common value was repeated three times; therefore, the participant's task was: (a) to find one common value in each pair, and (b) to report the common value that was repeated most frequently across the five pairs in each set. For instance, if two of the five pairs had a line above the shape, one had a triangle (i.e., the common shape), and three had small shapes, the correct answer was *small size of the shape*.

Participants in the Control Group received one warm-up trial, whereas participants in the Experimental Group received two warm-up trials. This was to provide the Experimental Group with more information about how to solve the task (i.e., hints about how to solve the problems effectively) and more practice with the task. At the completion of the main sets,

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only the Experimental Group received two extra sets for the goal-setting part of the experimental procedure.

In summary, the procedure for delivering the Concept-Identification Cards was as follows: (a) participants received an outline with an example about how they could solve the problem; (b) participants in the Control Group were presented with one set of cards as a warm-up trial, but participants in the Experimental Group received two sets of warm-up trials; (c) on receipt of each pair, participants had a maximum of 10 seconds (except for the Control Group, which had no time limit) in which to decide on the dimension that was common to the pair; (d) after this, they were asked to give their answer about the common value; (e) at the end of each set, participants were requested to specify the common dimension that had occurred most frequently across all five pairs; (f) participants in the Experimental Group received constructive and encouraging feedback about their answers after each pair on the warm-up or on the main-task sets (i.e., within-trials feedback), at the end of each set (i.e., across-sets feedback), and at the end of the entire five sets (i.e., overall feedback). Task Performance was measured by each participant's answer to the request to specify the dimension that had occurred most frequently across all five of the pairs.

Several manipulation techniques were used to enhance participants' Task-Specific Adaptive Motivation. *First*, participants in the Experimental Group were provided with an opportunity to choose whether they would work with a PC or a Macintosh; that is, they were given a choice. *Second*, they received specific information about how to perform the task that was assigned to them, e.g., "Don't worry if you can't find the right answer; staying calm and relaxed will help you do better." *Third*, they were given supportive feedback about their performance. *Fourth*, they were asked to set achievable goals for completing the task. On the other hand, the procedure used with participants in the Control Group did not include any motivational-enhancement techniques; that is, these participants were not (a) provided with a

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choice, (b) given specific information about how to complete the task successfully, (c) asked to set a realistic goal for completing the task, or (d) provided with supportive feedback. This procedure was expected neither to enhance the Control Group's enjoyment from completing the task nor to improve their expected chances of success in completing it. Compared to the Control Group, the effects of the four manipulation techniques used in the Experimental Group (i.e., choice, knowledge, feedback, and goal-setting) were expected to enhance (a) the positive affect that participants anticipated experiencing from completing the task, and (b) their expected chances of success in completing it.

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At the end of the procedure, each participant was given a debriefing sheet and a full explanation of the procedures employed. They were also given an opportunity to ask any questions and were thanked and discharged with the knowledge that they could contact the researcher later if they had further questions. Information that could identify individuals was not recorded on the study materials. The data were kept on a password-protected computer in a locked office.

Results

The statistical package SPSS, Version 27, was used for the analyses. Cronbach's alpha was used to determine the internal consistency of the psychometric measures. The minimum accepted alpha value was set at .70, and no scale violated this assumption.

Participants' baseline characteristics

On Age (Experimental Group: mean = 19.93 years, $sd = 2.018$; Control Group: mean = 19.79 years, $sd = 2.002$) and Years of University Education (Experimental Group: mean = 1.63 years, $sd = .490$; Control Group: mean = 1.46 years, $sd = .505$), there were no significant differences (Age: $t(77) < 1.0$, NS; Years of University Education: $t(77) = 1.46$, NS).

Additionally, the baseline Self-Efficacy scores for the Experimental Group (mean = 29.30, sd

= 3.950) and the Control Group (mean = 30.38, $sd = 2.612$) did not differ, $t(77) = 1.44$, NS, and the baseline Task-Specific Adaptive Motivation scores of the two groups also did not differ [Experimental Group: mean = 4.42, $sd = 1.497$; Control Group: mean = 4.75, $sd = 1.528$; $t(77) = 1.08$, NS].

Task performance

In terms of the number of Concept Identification Cards correctly answered, the Experimental Group ($N = 40$, mean = 3.50, $sd = 1.132$) was higher than the Control Group ($N = 39$, mean = 1.82, $sd = .97$), and the difference was statistically significant, $t(77) = 7.072$, $p < .001$.

Post-induction changes

In order to determine whether changes occurred in participants' scores on Self-Efficacy and Task-Specific Adaptive Motivation as a result of the experimental induction, change scores were calculated by subtracting participants' baseline scores from their respective post-intervention scores. Thus, positive change scores indicate increases, and negative change scores indicate decreases. On Self-Efficacy, the Experimental Group improved (mean change = .900, $sd = 3.120$), whereas the Control Group decreased (mean change = $-.3846$, $sd = 1.600$), and the difference between the two groups was statistically significant, $t(77) = 2.294$, $p < .025$. Similarly, on Task-Specific Adaptive Motivation, the Experimental Group improved (mean change = 1.178, $sd = 1.229$), whereas the Control Group decreased (mean change = $-.1346$, $sd = 1.378$), and the difference between the two groups was highly statistically significant, $t(77) = 4.472$, $p < .001$.

Alcohol consumption

Descriptive statistics were calculated to compare males and females on mean weekly drinking (mean weekly units of alcohol consumed). The results indicated that males (mean = 19.82, $sd = 17.87$) and females (mean = 17.22, $sd = 15.48$) did not differ, $t(77) < 1.0$, NS.

In order to identify potential differential effects of the experimental manipulation based on participants' level of drinking, the sample was divided into Light/Moderate and Heavy Drinkers, depending on whether participants were drinking within the current United Kingdom's National Health Service's guidelines for sensible drinking (National Health Service, 2021). That is, participants who drank 14 units of alcohol per week or less were designated as Light/Moderate Drinkers ($N = 41$, mean = 6.41, $sd = 3.42$), and participants who drank more than 14 units of alcohol per week were designated as Heavy Drinkers ($N = 38$, mean = 30.33, $sd = 15.06$), $t(77) = 9.90$, $p < .001$.

Next, a 2 X 2 factorial analysis of variance was run to determine the independent and interacting effects of (a) Drinking Level (Light/Moderate versus Heavy) and (b) Type of Experimental Induction (Experimental versus Control) on participants' Task Performance (i.e., the number of Concept Identification Cards correctly answered). The results indicated a highly significant effect for Group, $F(1, 79) = 46.073$, $p < .001$, which showed that the Experimental Group correctly answered more of the Concept Identification Cards (mean = 3.50, $sd = 1.132$) than the Control Group (mean = 1.82, $sd = .970$), but neither the effect for Drinking Level (Light/Moderate versus Heavy) nor the interaction between Group and Drinking Level reached statistical significance.

Next, 2 X 2 factorial analyses of variance were run to assess the independent and interacting effects of participants' Drinking Level and the Type of Induction (Experimental versus Control) on the other indices of improvements following the induction. In these analyses, the fixed factors were (a) Drinking Status (Light/Moderate versus Heavy) and (b) Type of Induction (Experimental versus Control), and the dependent variable was change scores for each of the dependent variables of interest. On Self-Efficacy, Type of Induction was significant, $F(1, 79) = 5.441$, $p < .022$, indicating that the Experimental Group's Self-Efficacy increased (mean change = .900, $sd = 3.120$), whereas the Control Group's Self-

Efficacy decreased (mean change = $-.385$, $sd = 1.600$). However, neither the main effect for Drinking Level nor the interaction between Type of Induction and Drinking Status reached statistical significance. Again, on Task-Specific Adaptive Motivation, only the effect for Group (Experimental versus Control) was significant, $F(1, 79) = 18.098$, $p < .001$, (Experimental Group: mean change = 1.178 , $sd = 1.229$; Control Group: mean change = $-.1346$, $sd = 1.338$).

Discussion

The results of the present study indicate that the experimental induction of Task-Specific Adaptive Motivation achieved each of the hypothesized effects. *First*, it enabled participants in the Experimental Group to achieve higher scores than the Control Group on the task involving the Concept Identification Cards. *Second*, it led to significant increases both in the Experimental Group's Self-Efficacy and in their Task-Specific Adaptive Motivation. *Third*, the effects of the experimental induction were as effective with the group of Heavy Drinkers as with the group of Light/Moderate Drinkers. These results, therefore, underscore the proof of concept of the experimental enhancement of participants' Task-Specific Adaptive Motivation, and they confirm that the induction is effective for both Light/Moderate Drinkers and Heavy Drinkers.

A limitation of the study was, however, the restricted sample of participants who were tested. The sample was recruited from undergraduate psychology students at Bangor University, United Kingdom. As in many other universities nowadays, the majority of psychology students at Bangor University are female, and 73.9% of the present sample of participants were females. Future research on the experimental induction of adaptive motivation should aim for a more balanced sample of males and females at other geographical locations. Additionally, (a) future research should be extended to include community residents who are heavy drinkers, and (b) the paradigm should be modified to

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extensions of these results. For instance, having maladaptive motivation related to one's employment could instigate motivational changes throughout one's life. This under-researched topic merits future investigation.

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Disclosures

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References

- Bagheri, M., & Cox, W. M. (2023). Self-regulation, adaptive motivation, and alcohol consumption: Understanding university students' motivation for drinking. *Journal of Substance Use*.
- Cox, W. M. (2000). *Alcohol use questionnaire*. Unpublished questionnaire. Bangor University.
- Cox, W. M., Fadardi, J. S., Hosier, S. G., & Pothos, E. M. (2015). Differential effects and temporal course of attentional and motivational training on excessive drinking. *Experimental and Clinical Psychopharmacology*, 23(6), 445-454.
- Cox, W. M., Fadardi, J. S., & Pothos, E. M. (2006). The addiction-Stroop test: Theoretical considerations and procedural recommendations, *Psychological Bulletin*, 132(3), 443-476.
- Cox, W. M., Hosier, S. G., Crossley, S., Kendall, B., & Roberts, K. L. (2006). Motives for drinking, alcohol consumption, and alcohol-related problems among British secondary-school and university students. *Addictive Behaviors*, 31, 2147-2157.
- Cox, W. M., & Klinger, E. (1988). A motivational model of alcohol use. *Journal of Abnormal Psychology*, 97, 168-180.
- Cox, W. M., & Klinger, E. (1990). Incentive motivation, affective change, and alcohol use: A model. In W. M. Cox (Ed.), *Why people drink: Parameters of alcohol as a reinforcer* (pp. 291-311). Gardner.
- Cox, W. M., & Klinger, E. (2002). Motivational structure: Relationships with substance use and processes of change. *Addictive Behaviors*, 27(6), 925-940.
- Cox, W. M., Klinger, E. (2004a). A motivational model of alcohol use: Determinants of use and change. In W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Concepts, approaches, and assessment* (pp. 121-138). Wiley.

- Cox, W. M., Klinger, E. (2004b). Measuring motivation: The Motivational Structure Questionnaire and Personal Concerns Inventory. W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Concepts, approaches, and assessment* (pp. 141-175). Wiley.
- Cox, W. M., & Klinger, E. (2011a). A motivational model of alcohol use: Determinants of use and change. In W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counselling. Goal-based approaches to assessment and intervention with addiction and other problems* (pp. 131-158). Wiley-Blackwell.
- Cox, W. M., & Klinger, E. (2011b). Measuring motivation: The Motivational Structure Questionnaire, Personal Concerns Inventory, and their variants. In W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Goal-based approaches to assessment and intervention with addiction and other problems* (pp. 161-204). Wiley-Blackwell.
- Cox, W. M., & Klinger, E. (2022). *Why People Drink; How People Change: A Guide to Alcohol and People's Motivation for Drinking It*. Springer.
- Cox, W. M., Schippers, G. M., Klinger, E., Skutle, A.; Stuchlikova, I., Man, F., King, A. L., & Inderhaug, R. (2002) Motivational structure and alcohol use of university students across four nations. *Journal of Studies on Alcohol* 63(3), 280-285.
- Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments & Computers*, 28(1), 1-11.
- Fadardi, J. S., & Cox, W. M. (2009). Reversing the sequence: Reducing alcohol consumption by overcoming alcohol attentional bias. *Drug and Alcohol Dependence*, 101(3), 137-145.
- Fadardi, J. S., Maddah Shorcheh, R., & Nematy, M. (2011). Moghayeseh sakhtareangizeshi va sabkhaye khordan dar zanane mobtala be ezafeh vazn va chaghi, va daraye vazne

tabicee [A comparison of motivational structure and eating behaviors in overweight and obese and normal-weight women]. *Journal of the Fundamentals of Mental Health*, 13(2), 170-181.

Feather, N. T., & Newton, J. W. (1982). Values, expectations, and the prediction of social action: An expectancy-valence analysis. *Motivation and Emotion*, 6(3), 217-244.

Field, M., & Cox, W. M. (2008). Attentional bias in addictive behaviors: A model of its development, causes, and consequences. *Drug and Alcohol Dependence*, 97, 1-20.

Helle, A. C., Boness, C. L., & Sher, K. J. (2022). College students' receptiveness to intervention approaches for alcohol and cannabis use. *Psychology of Addictive Behaviors*, 36(2), 157-176.

Hiroto, D. S. & Seligman, M. E. (1975). Generality of learned helplessness in man. *Journal of Personality and Social Psychology*, 31, 311-327.

Klinger, E., & Cox, W. M. (2011a). Motivation and the goal theory of current concerns. In W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Goal-based approaches to assessment and intervention with addiction and other problems* (pp. 3-47). Wiley-Blackwell.

Klinger, E., & Cox, W. M. (2004b). The Motivational Structure Questionnaire and Personal Concerns Inventory: Psychometric properties. W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Concepts, approaches, and assessment* (pp. 177-197). Wiley.

Klinger, E., & Cox, W. M. (2011b). The Motivational Structure Questionnaire, Personal Concerns Inventory, and their variants: Psychometric properties. In W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling: Goal-based approaches to assessment and intervention with addiction and other problems* (pp. 204-232). Wiley-Blackwell.

- Kofta, M., & Sedek, G. (1989). Repeated failure: A source of helplessness or a factor irrelevant to its emergence? *Journal of Experimental Psychology*, *118* (1), 3-12.
- LaBrie, J. W., Migliuri, S., & Cail, J. (2009). A night to remember: A harm-reduction birthday card intervention reduces high-risk drinking during 21st birthday celebrations. *Journal of American College Health*, *57*(6), 659-663.
- Mellentin, A. I., Cox, W. M., Fardari, J. S., Martinussen, L., Mistarz, N., Skøt, L., Rømer Thomsen, K., Mathiasen, K., Lichtenstein, M., & Nielsen, A. S. (2021). A Randomized Controlled Trial of Attentional Control Training for Treating Alcohol Use Disorder. *Frontiers in Psychiatry*, *12*.
- National Health Service (2021). Alcohol units. Retrieved on 27 January 2023, from <https://www.nhs.uk/live-well/alcohol-advice/calculating-alcohol-units/>
- Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy Scale. In J. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user's portfolio. Causal and control beliefs (pp. 35-37). Neer-Nelson.
- Shamloo, Z. S. (2007). *Information enhancement and goal setting: Interventions for enhancing motivation*. (Unpublished Ph.D. Thesis). Bangor University.
- Shamloo, Z. S., & Cox, W. M. (2010). The relationship between motivational structure, sense of control, intrinsic motivation and university students' alcohol consumption. *Addictive Behaviors*, *35*, 140-146.
- Shamloo, Z. S., & Cox, W. M. (2014). Information-enhancement and goal setting techniques for increasing adaptive motivation and decreasing urges to drink alcohol. *Addictive Behaviors*, *39*, 1205-1213.
- Tennen, H., & Eller, S. J. (1977). Attributional components of learned helplessness and facilitation. *Journal of Personality and Social Psychology*, *35*(4), 263-171.

van Eerde, W., & Thierry, H. (1996). Vroom's expectancy models and work-related criteria:

A meta-analysis. *Journal of Applied Psychology*, 81(5), 575-586.

Wiers, R. W., Houben, K., Fadardi, J. S., van Beek, P., Rhemtulla, M., & Cox, W. M.

(2015). Alcohol cognitive bias modification training for problem drinkers over the web. *Addictive Behaviors*, 40, 21-26.

Table 1

Dimensions of the Concept-Identification Cards and their Values.

Dimension	First value	Second value
Shape	Circle	Triangle
Size of the shape	Large	Small
Surface of the shape	Striped	Plain
Size of the letter	Large	Small
Position of the line	Above the shape	Below the shape