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Reinout W. Wiers [a,*], Katrijn Houben [b], Javad S. Fadardi [c,d], Paul van Beek [b,e], Mijke Rhemtulla [f], W. Miles Cox [d]

[a] Addiction Development and Psychopathology (ADAPT) Lab, Department of Psychology, University of Amsterdam, Amsterdam, The Netherlands
[b] Clinical Psychological Science, Maastricht University, Maastricht, The Netherlands
[c] Faculty of Education and Psychology, Ferdowsi University of Mashhad, Mashhad, Iran
[d] School of Psychology, Bangor University, United Kingdom
[e] RIVM, Centre for Infectious Disease Control, Bilthoven, The Netherlands
[f] Methods and Statistics, Department of Psychology, University of Amsterdam, Amsterdam, The Netherlands

HIGHLIGHTS

- First web-based test of different varieties of cognitive training in problem drinkers
- As usual in internet research large dropout (half after inclusion, another half during training)
- Drinking went down in all conditions, including sham-training control
- Combinations of motivational intervention and cognitive training should be studied

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ABSTRACT

Following successful outcomes of cognitive bias modification (CBM) programs for alcoholism in clinical and community samples, the present study investigated whether different varieties of CBM (attention control training and approach-bias re-training) could be delivered successfully in a fully automated web-based way and whether these interventions would help self-selected problem drinkers to reduce their drinking. Participants were recruited through online advertising, which resulted in 697 interested participants, of whom 615 were screened in. Of the 314 who initiated training, 136 completed a pretest, four sessions of computerized training and a posttest. Participants were randomly assigned to one of four experimental conditions (attention control or one of three varieties of approach-bias re-training) or a sham-training control condition. The general pattern of findings was that participants in all conditions (including participants in the control-training condition) reduced their drinking. It is suggested that integrating CBM with online cognitive and motivational interventions could improve results.

1. Introduction

Dual-process models emphasize the importance of both impulsive and reflective processes in many behaviors (e.g., Kahneman, 2003; Strack & Deutsch, 2004), including addiction (Bechara, 2005; Stacy & Wiers, 2010; Wiers et al., 2007). From this perspective, in addiction impulsive processes (e.g., attentional and approach biases to drug-related stimuli) gain control over behavior, even when the long-term perils of continued drug use are reflectively known. Cognitive Bias Modification (CBM) programs have been developed to target these cognitive processes in addiction, either through strengthening control processes (e.g., Houben, Wiers, & Jansen, 2011), or through changing biases in attention and action tendencies (review: Wiers, Gladwin, Hofmann, Salemink, & Ridderinkhof, 2013).

1.1. Attention Control Training

Problem drinkers have an attentional bias for alcohol-related stimuli, often assessed with varieties of the visual probe or alcohol-Stroop tasks (reviews: Cox, Fadardi, & Pothos, 2006; Field & Cox, 2008). Following the seminal study on attentional re-training in anxiety by MacLeod, Rutherford, Campbell, Ebsworthy, and Holker (2002), researchers in addiction began to investigate the effects of a single session of attentional re-training using similarly adapted visual probe tasks in heavy drinkers. Results showed that an attentional bias for alcohol could be changed, but after a single session no generalization was found to untrained

* Corresponding author at: Addiction Development and Psychopathology (ADAPT) lab, Developmental Psychology, Weesperplein 4, 1018 XA Amsterdam, The Netherlands.
E-mail address: r.wiers@uva.nl (R.W. Wiers).

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stimuli or to behavior (Field et al., 2007; Schoenmakers, Wiers, Jones, Bruce, & Jansen, 2007). Two studies examining the effects of *repeated* attentional re-training found more encouraging results.

Fadardi and Cox (2009) developed the Alcohol Attention Control Training Program (AACTP), aimed at increasing control over distraction by alcohol. The AACTP uses a variety of pictorial alcohol-Stroop tasks to train participants' attention away from alcohol-stimuli, with increasing levels of difficulty. The AACTP was tested with hazardous and harmful drinkers, using a within-subjects, waiting-list design. This design was chosen in part because the AACTP uses explicit goal-setting, which makes it difficult to create a sham-control condition. The AACTP significantly reduced both participants' attentional bias for alcohol and alcohol consumption, in the absence of changes during the initial one-month waiting period. Changes in bias and consumption were maintained at a three-month follow-up.

Schoenmakers et al. (2010) performed the first small RCT of repeated attentional re-training in alcohol-dependent patients. Patients were randomly assigned to re-training based on the visual probe task (5 sessions) or sham training, which included the same pictures and motivating feedback as the re-training. Results showed an increase in attentional bias in the control group and a significant decrease in attentional bias for alcohol stimuli in the experimental group, with generalization to untrained pictures. The CBM group was also discharged from treatment sooner and relapsed later than the control group.

1.2. Approach bias re-training

Problem drinkers show an approach-bias for alcohol-related stimuli (Field, Kiernan, Eastwood, & Child, 2008; Wiers, Rinck, Dictus, & van den Wildenberg, 2009). In the alcohol Approach-Avoidance Task (Wiers et al., 2009), participants are instructed to pull or push in response to a stimulus-feature unrelated to the contents of the picture (e.g. pull the joystick in response to pictures in landscape format, push pictures in portrait format). With a re-training variety of this task, it was demonstrated that students' alcohol approach-bias could be successfully modified (Wiers, Rinck, Kordts, Houben, & Strack, 2010). In a subsequent RCT with alcohol-dependent patients (Wiers, Eberl, Rinck, Becker, & Lindenmeyer, 2011), patients were randomly assigned to one of two experimental conditions or one of two control conditions. Both experimental conditions involved four sessions of approach-bias re-training with a modified AAT, one with explicit instruction (push alcohol pictures), the other with implicit instructions (push pictures in one format; during training all alcohol pictures came in the push-format). One control condition consisted of continued assessment (alcohol pictures pushed and pulled equally often); the other consisted of pre- and posttest assessment only. Results indicated reduced approach bias in both experimental groups, both on the alcohol AAT (generalization to untrained pictures) and on an Implicit Association Test (Ostafin & Palfai, 2006). Patients in the experimental conditions relapsed 13% less often in the year to follow, compared with patients in the control-groups. In a replication-study (Eberl et al., 2013), 509 alcohol-dependent patients received either approach-bias re-training or no training. Training resulted in 10% less relapse after a year, mediated by the change in alcohol-approach action-tendencies.

1.3. This study

In the present web-based study, attention control training (AACTP) and approach-bias re-training (varieties of the AAT) were directly compared. We hypothesized that all varieties of training would result in a greater reduction in drinking than sham-training. The study was different from earlier studies with clinical samples in which the goal of treatment was abstinence from alcohol; in the present study, participants' goal was to reduce their drinking. Also, the study was entirely web-based, which has strong potential advantages, when effective (great potential impact at low costs, cf. Riper et al., 2008; Riper et al., 2011).

To summarize, we tested the efficacy in reducing problem drinking with internet-delivered training interventions, all of which have produced promising outcomes in stand-alone versions. We also included a number of psychological measures on which the AACTP had previously shown positive results (e.g., self-efficacy). The present design had three additional advantages: The large majority of participants would receive a training from which we expected a positive effect (attractive for participants). Second, the AACTP intervention could be compared with a sham-training control group. Third, the different types of alcohol-CBM for which previous research had reported positive results could be directly compared.

2. Method

2.1. Participants

Participants were recruited via newspaper and online advertisements and a website. A total of 697 participants completed screening, 7 of whom were excluded for age (younger than 18), 42 for scoring lower than eight on the AUDIT (Alcohol Use Disorder Identification Test; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993), 13 for not completing the AUDIT, and 20 for dyslexia. Color-blind participants were not excluded, but could not be assigned to the AACTP experimental condition, which requires intact color vision. The remaining 615 adults gave informed consent online and were randomly assigned to one of five conditions. They were subsequently invited to participate in the online pretest session. A total of 314 participants (51%) initiated the pretest. Of these, 136 participants (44%) also completed the posttest after the last training session (see Table 1). The first follow-up was one month after the posttest ($N = 109$, 35%), the second two months later ($N = 87$, 28%).

2.2. Measures

2.2.1. Demographic characteristics

Participants reported their gender, age, origin, knowledge of the Dutch language, color vision, dyslexia, and educational level.

2.2.2. Alcohol Use Disorders Identification Test

The AUDIT is a brief screening instrument to identify likely hazardous alcohol use and alcohol-related problems.

2.2.3. Alcohol consumption

A Dutch adaptation (Wiers, Hoogeveen, Sergeant, & Gunning, 1997) of the self-report Timeline Follow-Back procedure (Sobell & Sobell, 1990) assessed alcohol consumption. On a calendar participants indicated the number of standard units of alcohol consumed during each day in the past two weeks.

2.2.4. Other substance-use

Lifetime use of other substances was asked with a grid and 10-point scale (0-10, …, 91 + times used).

2.2.5. Craving VAS

Participants were asked to indicate on a Visual Analog Scale (VAS) how much they craved alcohol now.

2.2.6. Readiness to Change Questionnaire (RCQ)

The RCQ (Rollnick, Heather, Gold, & Hall, 1992) assigns respondents to the pre-contemplation, contemplation, or action stage. Scores were also combined into a single scale, after changing the signs of the pre-contemplation items (Forsberg, Ekman, Halldin, & Rönnberg, 2004). Cronbach's alpha was .76.

Table 1
Overview of baseline characteristics and intervention effects per condition.

Variable	AACTP (N = 17)	ATT100 Explicit (N = 27)	ATT100 Implicit (N = 35)	ATT90 Implicit (N = 33)	AAT50 Control (N = 24)	Time Effect F(1, 131)	Condition F(4,131)	Time x Condition F(4, 131)
Age (years)	46.1	48.1	46.9	49.4	48.7		.38	
Gender ratio (F/M)	9:8	10:27	14:21	14:19	15:9		□2 (4) = 4.5	
Level of education	5.77	6.26	6.09	6.67	6.54		1.44	
AUDIT	18.7	21.1	20.9	21.4	18.7		1.31	
Alcohol Use Pre	3.55	4.24	3.34	4.36	3.58	24.2***	.53	2.09 □
Alcohol Use Post	2.64	3.34	3.22	3.17	3.10			
Alcohol Use F-up-1 (N)	3.27 (14)	2.97 (25)	2.67 (30)	3.59 (21)	2.72 (18)			
Alcohol Use F-up-2 (N)	3.22 (14)	2.82 (20)	2.26 (22)	3.77 (12)	2.80 (18)			
Craving VAS Pre	25.8	13.6	28.5	27.1	40.3	3.33 □	2.66*	1.26
Craving VAS Post	23.5	16.7	19.0	24.8	26.0			
Self-efficacy Pre	3.81	4.27	4.14	3.88	3.99	28.0***	.32	2.35 □
Self-efficacy Post	4.94	4.73	4.33	4.46	4.25	.36	.06	.79
Stage of Change Pre	2.40	2.52	2.36	2.58	2.47			
Stage of Change Post	2.48	2.36	2.46	2.48	2.43			

*** = $p < .001$; ** = $p < .01$, * = $p < .05$; □ = $p < .10$.
Legend: AACTP = Alcohol Attention Control Training Program; ATT = Action Tendency Training; AAAQ = Approach Avoidance Alcohol Questionnaire.

2.2.7. Self-efficacy

Self-efficacy to resist temptation to drink in high-risk situations was assessed with 12 questions (adapted from Dijkstra & De Vries, 2000). Participants were asked to imagine a high-risk situation and indicate how certain they were about controlling their alcohol use, ranging from "absolutely not sure" to "absolutely sure". Cronbach's alpha was .88.

2.3. Procedure

The ethics committee of the psychology faculty of Maastricht University (the first author's affiliation when the study was initiated) approved the study. Information about the study was given through a dedicated website, where participants could register. After registration, an online screening session was done. Participants meeting inclusion criteria were asked to give informed consent. Time between sessions ranged from two to 14 days; only the post-test session was to be completed between five and 14 days after the final training session. Prior to each session, participants were sent a reminder e-mail. When a session was not completed, two additional reminders were sent. After two weeks of failure to respond, participants were excluded. At posttest the same measures were taken as during pretest (all questionnaires except the screeners). One month after post-test, participants were sent a request to take part in the follow-up sessions, during which the same questionnaires were assessed. Participants did not receive monetary compensation for the training, but did receive monetary compensation (€25) for completing both follow-up questionnaires. In each condition, participants were trained during four sessions. The nature of the training sessions varied according to the condition to which a participant had been assigned:

2.3.1. AACTP

Participants were trained with a Dutch translation of the AACTP (Fadardi & Cox, 2009). Readers are referred to the original publication for details of the training, briefly summarized here. The AACTP consisted of six tasks. Participants first practiced pressing the key on a computer keypad that corresponded to each of four colors until they had reached a certain speed (<1000 ms) and accuracy (90% correct). Second, they completed a classical Stroop color-interference test (Stroop, 1935) and an alcohol-Stroop test (Cox et al., 2006). The fourth, fifth, and sixth tasks consisted of the AACTP training-tasks with increasing levels of difficulty. Participants were instructed to name the color content of each stimulus and ignore the alcohol content as quickly and accurately as possible. Before these tasks started, subjects were asked to choose eight alcoholic and eight nonalcoholic beverage bottles on the basis of preference and familiarity, which were used during training. In the fourth task, participants were instructed to react to the colored background of a series of bottles, half of which were alcohol-related and half not. In the fifth task, the bottles were surrounded by a narrow, colored outline, to be named. In the sixth task, pairs of alcoholic and nonalcoholic bottles appeared simultaneously, and participants were asked to respond to the outline color of the nonalcoholic bottle.

2.3.2. Action Tendency Training (ATT)

Three versions of approach-bias re-training were included which had been used before (detailed below), which differed in explicitness of instruction and percentage of alcohol-pictures to be pushed (90 or 100% in the active conditions 50% in the control-condition). On the one hand, based on implicit learning research, indirect instruction should work better, but on the other hand, explicit instruction might be more motivating (see Wiers et al., 2013). Based on earlier research, we also did not know whether 90% or 100% pushing alcohol would work better. Participants performed a mouse-operated version of the AAT-task. In the original AAT-task, a joystick was used, which was unsuitable for use over the Internet. When the mouse was pulled toward the participant's body, the pictures' size increased (zoom-in effect); when the mouse was pushed, the pictures' size decreased (zoom-out; cf., Wiers et al., 2009). In all ATT-conditions, half of the stimuli were pushed, half pulled. Each session consisted of 220 trials with a short break halfway. Depending on the experimental condition, participants received one of four versions of the AAT-training:

2.3.2.1. ATT100-Explicit. Participants were informed that they should push pictures of alcohol away, and pull pictures of soft drinks toward them (Wiers et al., 2011).

2.3.2.2. ATT100-Implicit. Participants were instructed to react to the format of the picture by pushing the mouse away when one kind of format was presented (e.g., landscape), and pulling the mouse toward them when the other format was presented (e.g., portrait). All alcohol pictures appeared in the push-format, and all non-alcohol pictures appeared in the pull-format (Wiers et al., 2011).

2.3.2.3. ATT90-Implicit. Instruction as ATT100-Implicit, but now 90% of the alcohol pictures appeared in the push-format, with the reverse contingency for the control pictures (Wiers et al., 2010).

2.3.2.4. ATT50-Control. Instructions were identical to the previous two conditions, but now half of the alcohol pictures (and non-alcohol pictures) were pushed and half pulled (as in Wiers et al., 2010; Wiers et al., 2011).

2.4. Statistical analyses

The main outcome variables were measures of alcohol use (drinking at post-test and follow-ups).[1] These were analyzed with planned comparisons on the change-scores. In the first contrast, we compared the effects of the four different active varieties of CBM (condition 1-4) with the control condition (ATT50-Control). The second comparison contrasted the effect of attentional re-training, with the pooled effect of the three varieties of approach-bias re-training. The third comparison contrasted the three forms of approach-bias re-training with the control condition. The fourth comparison contrasted AACTP with the control condition.

We first tested whether there were (unexpected) differences at pre-test, using post-hoc comparisons (Games-Howell and Tukey, as recommended by A.P. Field, 2013). For drinking at posttest and follow-ups, all planned contrasts were performed twice, once using complete cases (i.e., listwise deletion), and once using multiple imputations. Fifty imputed data sets were created using predictive mean matching in the R-package MICE (Van Buuren & Groothuis-Oudshoorn, 2011). Results were combined in R using Rubin's rules (Rubin, 1987), with degrees of freedom adjusted using Barnard and Rubin's (1999) method, as described in Van Buuren (2012).

In order to provide optimal insight into the data, means for all groups for all variables analyzed along with statistics of the overall Repeated Measures ANOVA are presented in Table 1, and in Table 2 outcomes for the main variable (reduction in drinking) with effect-sizes and confidence-intervals per group. For secondary process variables we only tested the planned comparisons in case of an indication of a Time x Condition effect.

3. Results

In addition to alcohol, the large majority of participants were current or past smokers (77%), without much lifetime use of other substances (<30% reported marijuana on 20 or more occasions, <20% medication on more than 20 occasions, and less than 10% other drugs on 10 or more occasions, in the absence of differences between the groups, $F_{40,1172} = 1.07$, $p = .35$. Dropout was not significantly associated with condition ($p > .30$). Two participants in the AACTP condition did not finish any training module, and were discarded from further analyses. There was no significant difference between conditions in drinking levels at pretest (p-values > .50 for all comparisons). For drinking at posttest (complete cases), none of the planned comparisons were significant, (all p-values > .42). As evident from Table 1, alcohol use decreased in all conditions (strong main effect of Time, $F_{1,\ 131} = 24.2$, $p < .001$). Multiple imputation results confirmed a main effect of Time (reduction in drinking), $T(79) = 5.71$, $p < .01$, irrespective of condition.

The same planned comparisons were tested for alcohol use at both follow-ups. At one-month follow-up, the second comparison approached significance for complete cases, $T_{103} = 1.89$, $p = .06$. Moreover, the second comparison was significant at three-month follow-up, complete cases, $T_{81} = 2.44$, $p = .017$. This suggests that approach-bias re-training had a stronger effect on reducing alcohol consumption at follow-ups than AACTP. When considering the effect-sizes of the reductions in complete cases (Table 2), two varieties of approach-bias re-training showed the strongest reductions (ATT100Explicit and ATT90Implicit, effect-sizes .4 to .5), while the effect-size of the reduction in the ATT100Implicit version was similar to that of the control condition (around .3), and the effect size of AACTP was smallest (.1).

[1] We focus this report on the main outcome variables, which are related to alcohol use. In addition, attentional bias and approach bias were assessed at pre- and posttest, but these data were of suboptimal quality, and reporting them would require far more space. Some additional questionnaires were also included, but they are not reported due to space limitations. The general pattern of results was the same as reported here: Beneficial changes across all conditions.

Table 2
Effects on Alcohol Use Per Condition.

Condition	Reduction In Drinking (glasses per day)	Confidence Interval	T (df)	p	d
Posttest					
AACTP	.90	<.10, 1.70>	2.40 (16)	.029	.58
ATT100 Explicit	.92	<.23, 1.58>	2.76 (26)	.011	.53
ATT100 Implicit	.12	<-.45, .69>	.43 (34)	.67	.07
ATT90 Implicit	1.20	<.62, 1.76>	4.27 (32)	<.001	.67
ATT50 Control	.48	<-.25, 1.21>	1.36 (23)	.19	.28
Posttest itt					
AACTP	.28	<.02, .55>	2.20 (53)	.032	.29
ATT100 Explicit	.43	<.10, .76>	2.59 (56)	.012	.34
ATT100 Implicit	.06	<-.23, .35>	.44 (66)	.66	.06
ATT90 Implicit	.51	<.24, .79>	3.74 (76)	<.001	.43
ATT50 Control	.48	<-.25, 1.21>	1.36 (23)	.18	.19
Follow-up 1 itt					
AACTP	.07	<-.17, .32>	.57 (53)	.57	.07
ATT100 Explicit	.63	<.28, .98>	3.63 (56)	.001	.48
ATT100 Implicit	.37	<..05, .69>	2.38 (66)	.02	.29
ATT90 Implicit	.41	<.18, .65>	3.57 (76)	.001	.40
ATT50 Control	.39	<.03, .76>	2.18 (52)	.034	.30
Follow-up 2 itt					
AACTP	.08	<-.14, .31>	.76 (53)	.45	.10
ATT100 Explicit	.58	<.23, .93>	3.29 (56)	.002	.44
ATT100 Implicit	.50	<..17, .84>	2.97 (66)	.004	.36
ATT90 Implicit	.51	<.25, .80>	3.86 (76)	<.001	.44
ATT50 Control	.37	<.-02, .76>	1.89 (52)	.064	.26

Legend: AACTP = Alcohol Attention Control Training Program; ATT = Action Tendency Training.

However, these findings were not confirmed in the multiple imputation analyses for both follow-up points, where no planned contrast was significant (all p-values > .30).

Only in the AACTP condition, participants determined the number of training modules per session. They showed considerable variability in the number of trials on which they trained (mean = 1,277 trials, sd = 1,098). The amount of training, however, was not related to the reduction in use, ($p > .50$), but was related to alcohol use at the pretest, $r_{17} = .72$, $p = .001$.

Of the other psychological variables assessed (see Table 1), beneficial changes were generally found across all conditions (less craving, higher self-efficacy). Only for self-efficacy a statistical trend for the Time by Condition interaction was observed. For self-efficacy, both the second and the fourth planned comparisons were significant, $T_{132} = 2.45$, $p = .016$. As can be seen in Table 1, AACTP showed the strongest increase in self-efficacy, stronger than the pooled active conditions of approach-bias re-training (comparison 2), and stronger than the control-condition (comparison 4).

4. Discussion

The effects of web-based CBM was tested in self-selected problem drinkers. The AACTP program aimed at increased attentional control was compared with four versions of approach-bias re-training, including a sham-control condition. The main finding was that drinking was reduced across all conditions at posttest. In complete case analyses, at one and three-months follow-up approach-bias re-training had a stronger effect than AACTP. However, these findings should be interpreted with caution for two reasons. First, the reduction in drinking in the approach-bias re-training was not significantly different from the reduction in the sham-training group. Second, the multiple imputation results indicated a reduction in drinking across all conditions. Finally, participants in the AACTP condition showed the strongest improvement in self-efficacy.

The main outcome can be described as negative: our main hypothesis of stronger reduction of alcohol use after active training compared with sham-training was falsified. However, from a clinical and public

health perspective this finding is less negative: it indicates that participants in all groups reduced their drinking. The lack of a differential outcome in drinking contrasts with research with clinical groups, where experimental groups improved significantly more than controls (Eberl et al., 2013; Schoenmakers et al., 2010; Wiers et al., 2011). A similar discrepancy has been reported for anxiety disorders (positive results for clinical trials, e.g., Amir, Beard, Burns, & Bomyea, 2009; negative results for online trials, e.g., Carlbring et al., 2012). What could explain this difference? A first reason could be statistical power: In the studies with approach-bias re-training, the clinical samples were larger than the present sample, with hardly any dropout. A second reason could be the different goals in the two kinds of studies: A goal of abstinence for alcohol-dependent patients, and reduced drinking for problem drinkers. Perhaps for highly motivated problem drinkers, simply answering questions about their alcohol consumption sufficed to reduce their drinking. Indeed, there is evidence that monitoring drinking already has a moderating effect on drinking outcomes (Miller et al., 1995). A third reason could be that with clinical samples (Eberl et al., 2013; Schoenmakers et al., 2010; Wiers et al., 2011), CBM-training was added to treatment as usual: Cognitive Behavioral Therapy (CBT) and Motivational Enhancement Therapy (MET). Perhaps significantly different effects between experimental and control conditions appear only when the training supplements a more traditional CBT/MET intervention. Such interventions can also be delivered online (Riper et al., 2008; Riper et al., 2011); therefore in a new study we combine online CBT with CBM (study-design: van Deursen, Salemink, Smit, Kramer, & Wiers, 2013), consistent with theoretical ideas on the intertwined nature of motivation and control (Wiers et al., 2013).

The present study had a number of limitations. First, in line with much Internet research, dropout was high (Eysenbach, 2005), with half of the participants never starting the training after they had been included and of those who started another half dropping out during training. One solution to this problem would be to create more motivationally engaging interventions, for example, by introducing gaming elements, as has been successfully done in cognitive training for children with ADHD (e.g., Dovis, Van der Oord, Wiers, & Prins, 2012). Although the AACTP is not really a game, it does contain more game-like elements than the versions of approach-bias re-training tested here (e.g., feedback on scores, levels of difficulty). This could perhaps explain the finding that the AACTP increased self-efficacy more than approach-bias re-training did. Second, we decided to test the original AACTP procedure and compared this with previously used varieties of approach-bias re-training. The web-based training, however, differed on a number of parameters from the original version (e.g. mouse instead of joystick; abstinence goal or not), making it difficult to determine exactly which aspects of the training produced different effects. Third, unfortunately, we did not collect data on participants' subjective experiences or their motivation to perform the training. A specific questionnaire could address the extent to which participants believe the training could be beneficial. Hence, we call for further research that combines varieties of cognitive training with cognitive motivational approaches, either online (which could help to decrease rates of dropouts) or face-to-face.

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Contributions

RWW and KH designed the study. WMC and JSF contributed to the translation and adaptation for the web of the AACTP intervention. PvB helped in data collection and description of the study. RWW wrote the ms., which all authors contributed to and approved for publication.

Conflict of interest

RWW gave a paid talk for Lundbeck pharmaceutical company.

RWW was co-applicant in two awarded grants from ERAB (the European Foundation for Alcohol Research), and KH was PI of one awarded grant for ERAB. ERAB is an independent foundation that awards alcohol-related research after an independent scientific evaluation (peer reviewed), with guarantee of completely independent scientific expression (in accordance with the Dublin principles), http://www.api.or.at/sp/alcoholpolicy%20dokumente/dublinpriciples.pdf

RWW was also involved in the ERAB Underage Drinking Report (2012), which was also done in accordance with the Dublin principles.

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