The Cognitive Bases of Addictive Behaviors:

Effectiveness of Drug-Attention-Control Training Program with Drug Abusers

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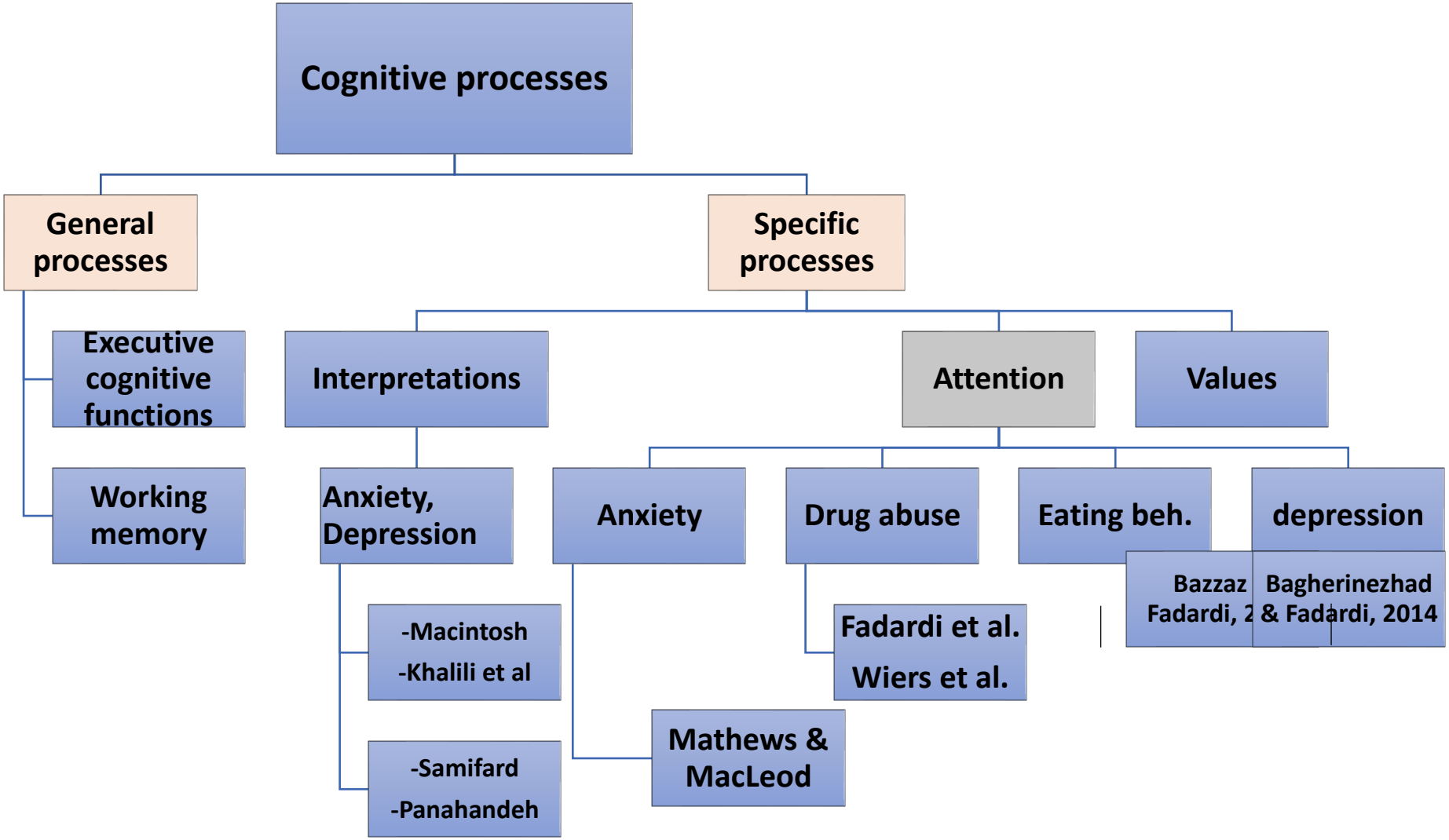
Mashhad

Faculty of Education and Psychology


Cognitive processes
General processes
Specific processes
Executive cognitive functions
Working memory
Interpretations
Attention
Values
Anxiety, Depression
Anxiety
Drug abuse
Eating beh.
depression
-Macintosh
-Khalili et al
-Samifard
-Panahandeh
Mathews & MacLeod
Fadardi et al.
Wiers et al.
Bazzaz
Fadardi, 2
Bagherinezhad
& Fadardi, 2014

Substance-related cognitive biases

- plays an important role in the continuation of and relapsing to addictive behaviors (Garland et al. 2012; Marhe et al. 2013).

- more *aware* of substance-related cues

- interfere with *higher-order cognitive processes*, including concentration (Waters & Green 2003) and working memory (Houston et al. 2014; Narendran et al. 2014).

Substance-related cognitive biases (Cont'd)

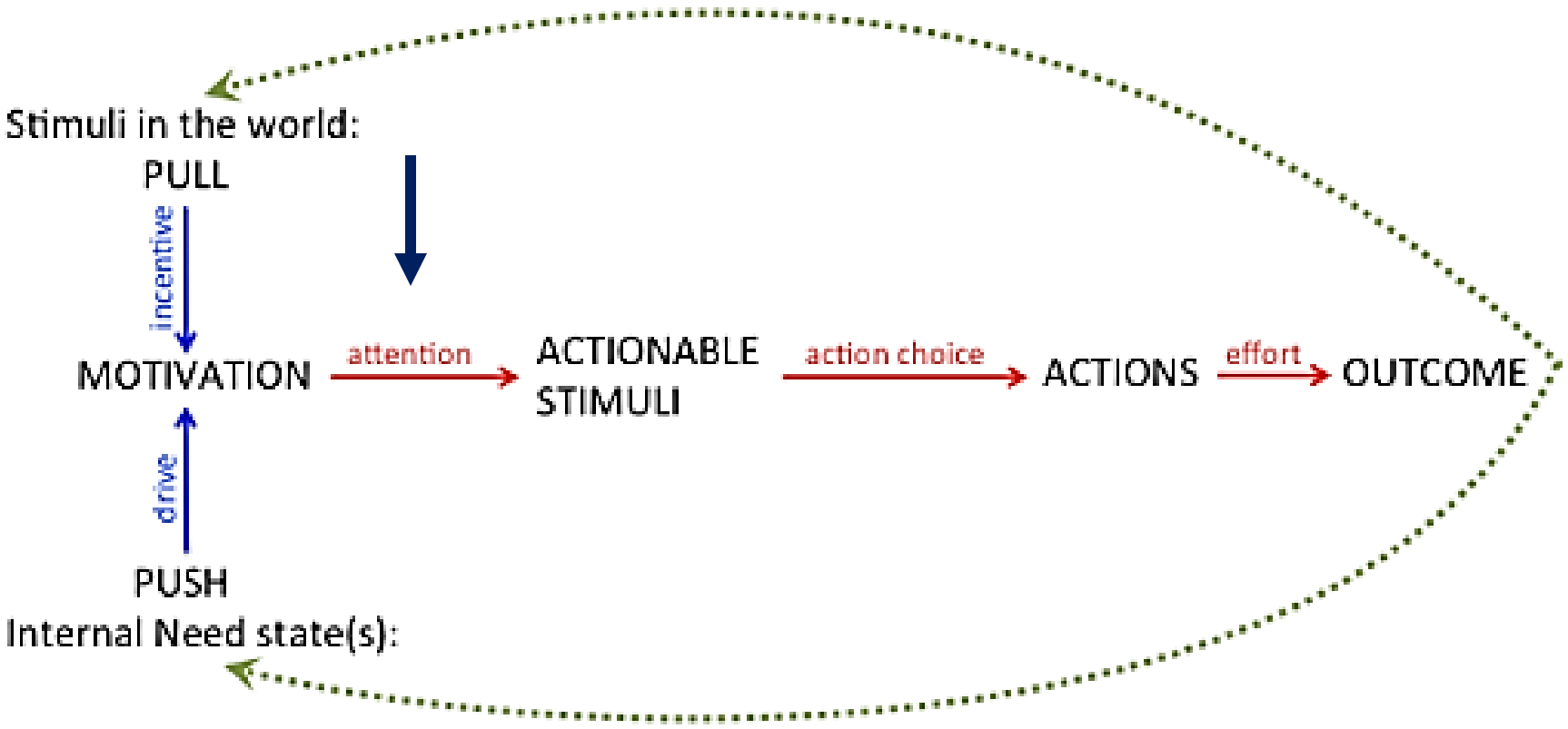
- affects information processing in mesolimbic brain areas: nucleus accumbens and the amygdala (Wiers et al. 2014).

- reduce the controlling role of reflective (cold) processes over impulsive (hot) processes (Pieters et al. 2014).

- Increases the triggering effects of cognitive biases on drinking-related decisions (Wiers et al. 2014).

Attentional bias

- refers to a person's *automated* tendency to focus on and give processing priority to stimuli that are related to his or her *current concerns* (Cox, Klinger, Fadardi, 2015)

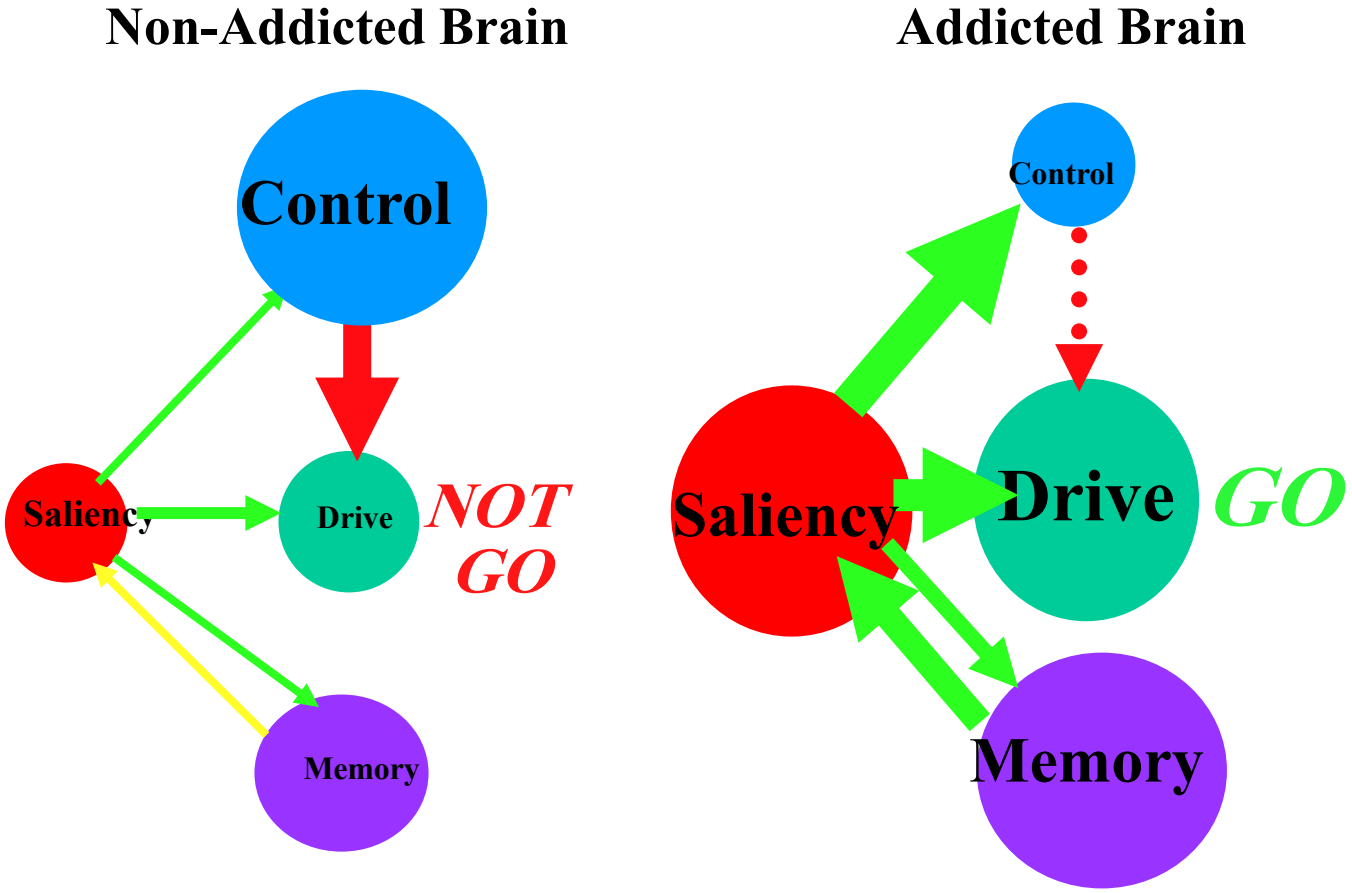


Motivation Cycle:

- Push/pull, drive/incentive elements of motivation denoted in blue.
- Basic functions of motivation in red.
- Effect of experience on motivation, green.


OREO

Addiction Changes Brain Circuits



Source: Adapted from Volkow et al., Neuropharmacology, 2004.

DO NOT ATTEND to IT!


AACTP_Shockwave - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Please log in by clicking the 'Enter Participant' button, below.
REAL
Steps
1
5
PRACTICE
Select Favourites
SETUP
3
7
HALOS
0
STROOP
beer home shed
0
4
8
PAIRS
0
Alcohol Attention-Control Training Programme (AACTP)
Javad Salehi Fadardi*# & W. Miles Cox*
Enter Participant ID
Results Graphs
* School of Psychology
University of Wales, Bangor
United Kingdom
#Department of Psychology, Ferdowsi University of Mashhad, Iran
Logout
Done
Internet

The AACTP Procedure….

1. To slow down cognitive processes elicited by alcohol cues.

2. To speed up (strengthen) inhibitory processes paradoxical to alcohol-attentional bias.

The AACTP

- A newly developed, user-friendly version

OUT OF SIGHT, OUT OF MIND!

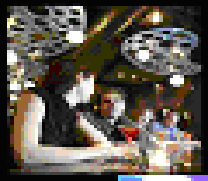
http://www.bangor.ac.uk/~pss005/AACTP/ - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address [redacted] Go Links
Search Web Save to My Web Sign In
Google Search 3 blocked Check AutoLink AutoFill Options

A.A.C.T.P.

Introduction

Instructions

Any other information



Proceed to the AACTP program (registered participants only)

Internet

AACTP

A.A.C.T.P. v.1

Javad S. Fadardi, PhD W. Miles Cox, PhD
University of Wales, Bangor

Continue

Concept demonstrator by Xavier Educational Software Ltd

AACTP_Shockwave - Microsoft Internet Explorer

File Edit View Favorites Tools Help

REAL

Please log in by clicking the 'Enter Participant' button, below.

Steps

PRACTICE 1

STROOP CLASSIC 0 2

SETUP 3

STROOP 0 4
beer home shed

Select Favourites 5

RECTANGLES 0 6

HALOS 0 7

PAIRS 0 8

Enter Participant ID

Results Graphs

Logout

Done

Internet

AACTP_Shockwave - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Keyboard familiarity

Stage Two:

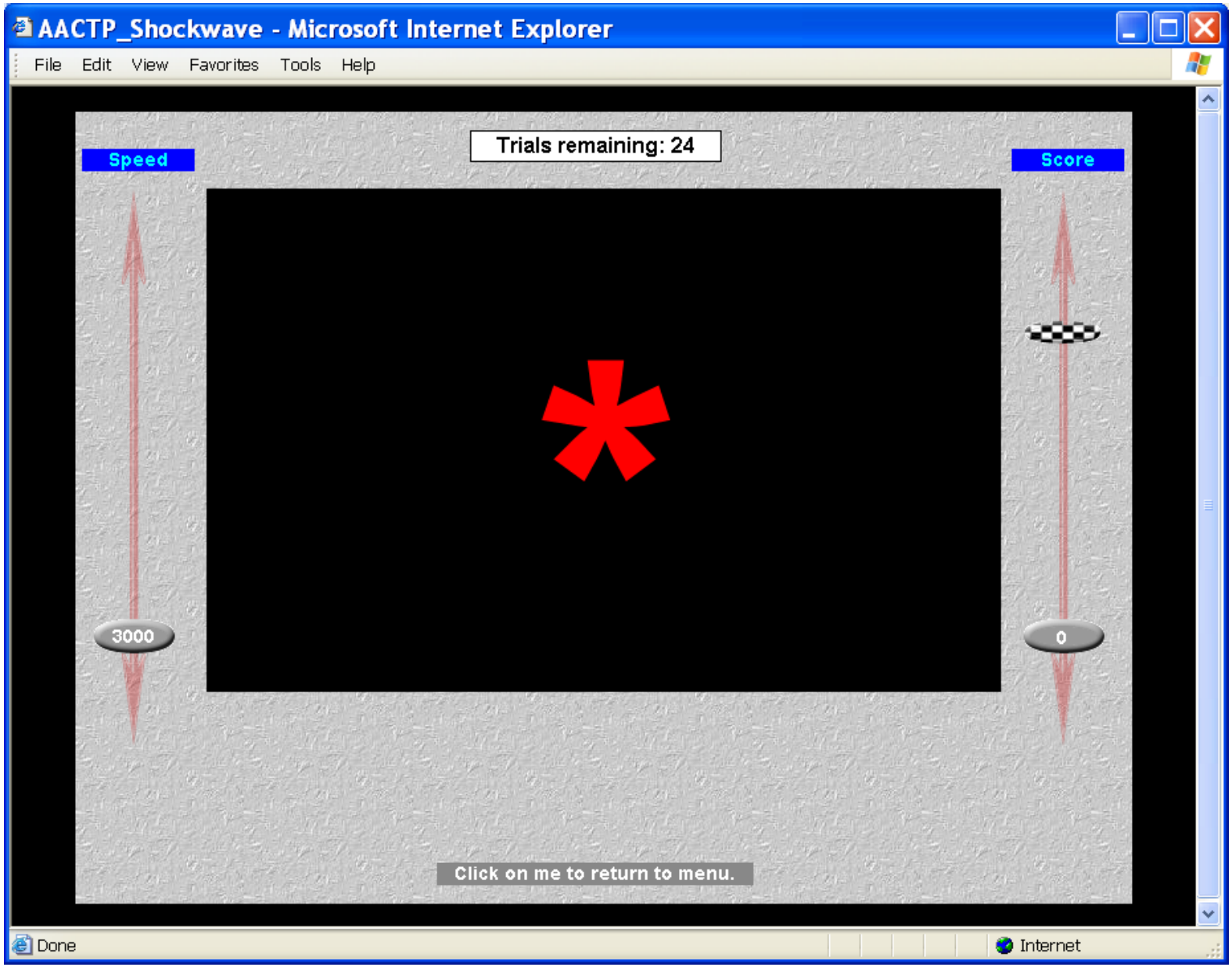
You need to learn the correct position of each colour key on the keyboard so that you can press the correct key for each colour without looking at the keyboard. Use your second and fourth fingers of each hand to press the keys (i.e, four fingers). See the picture below.

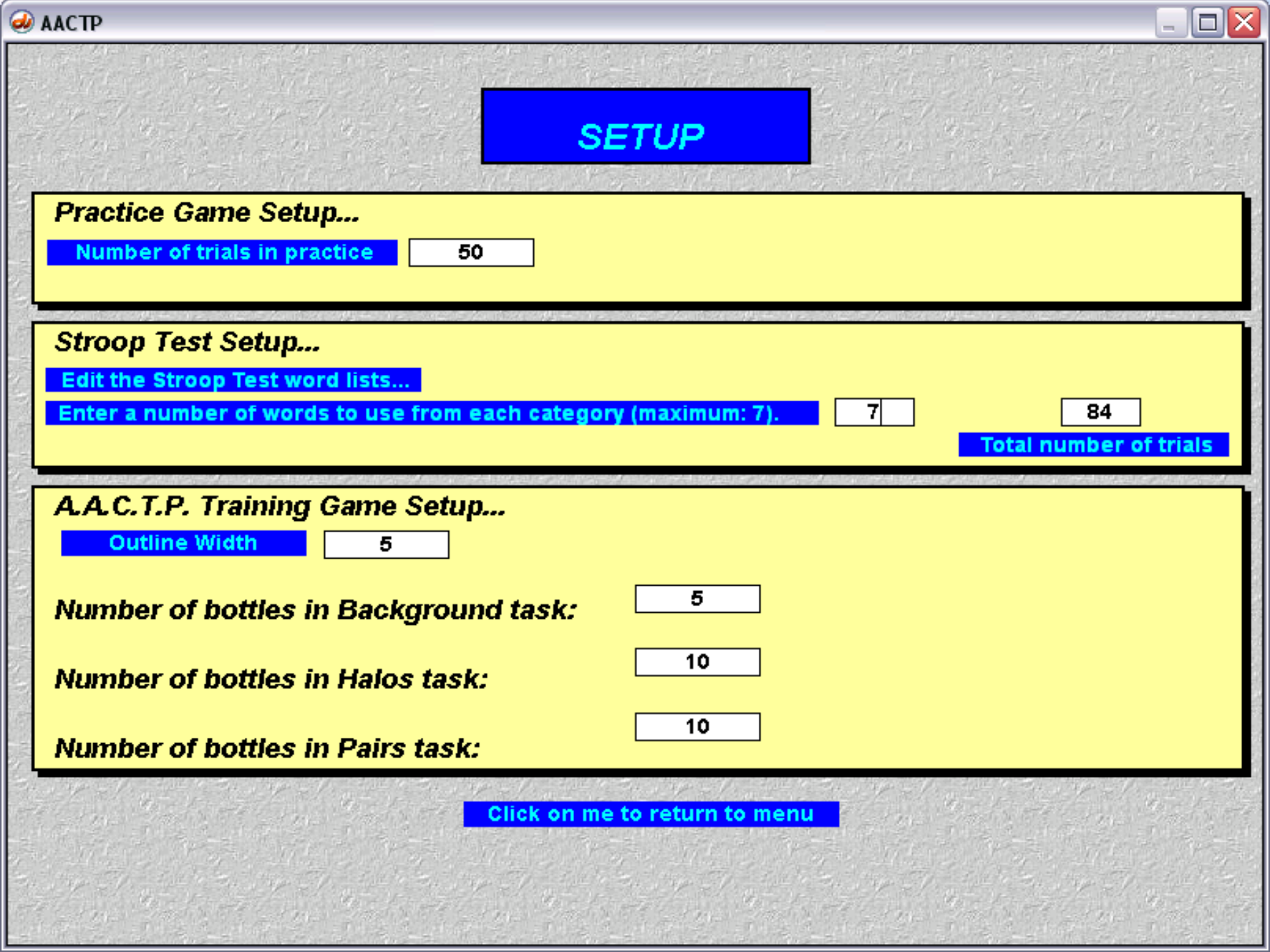
< Previous

Next >

Click on me to return to menu.

Done Internet

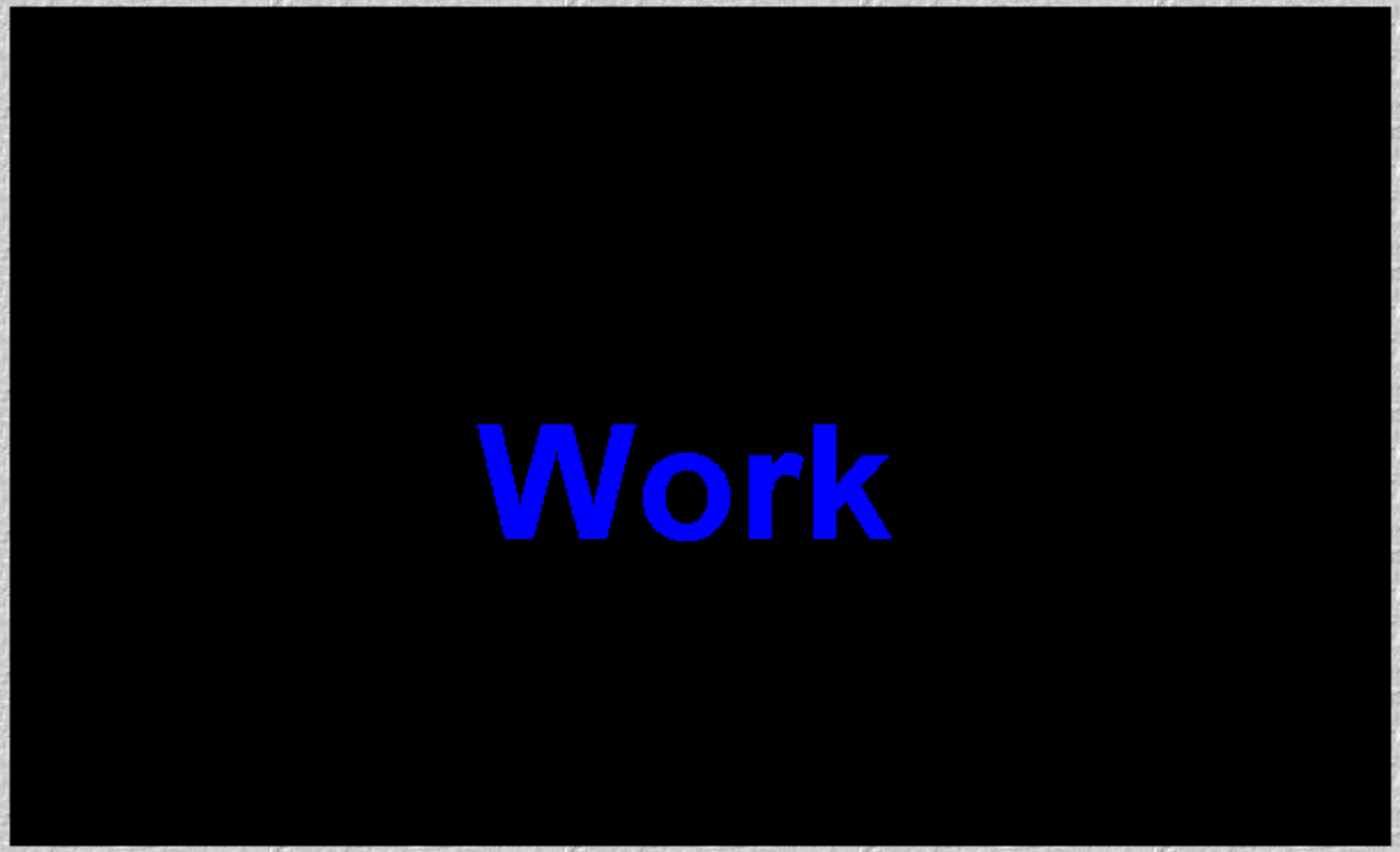

AACTP_Shockwave - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Trials remaining: 24
Speed
Score
3000
0
Click on me to return to menu.
Done
Internet


AACTP
SETUP
Practice Game Setup...
Number of trials in practice
50
Stroop Test Setup...
Edit the Stroop Test word lists...
Enter a number of words to use from each category (maximum: 7).
7
84
Total number of trials
A.A.C.T.P. Training Game Setup...
Outline Width
5
Number of bottles in Background task:
5
Number of bottles in Halos task:
10
Number of bottles in Pairs task:
10
Click on me to return to menu

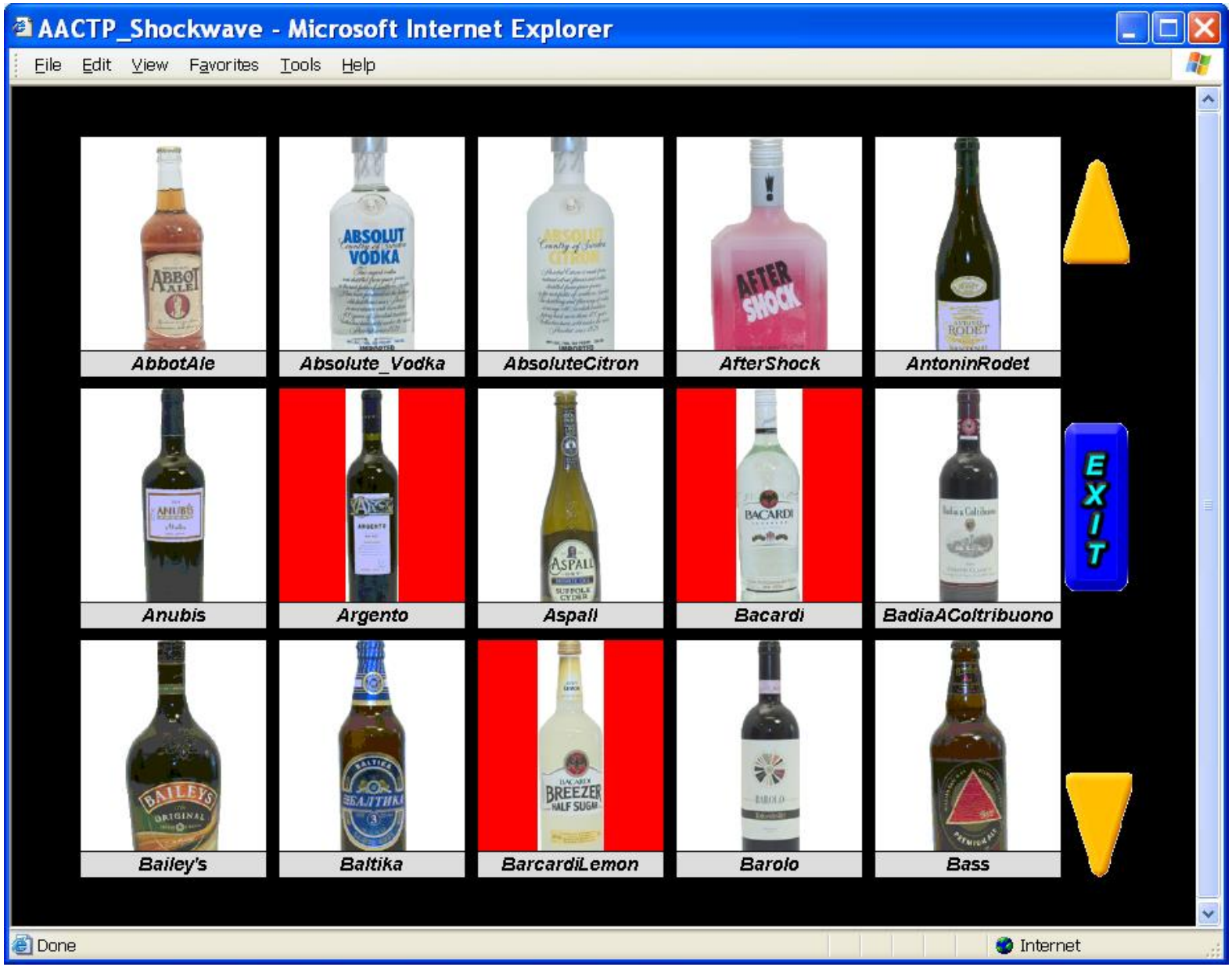
AACTP

Click on me to return to menu


AACTP
Socket
Click on me to return to menu



Click on me to return to menu


AACTP_Shockwave - Microsoft Internet Explorer
File Edit View Favorites Tools Help
AbbotAle
Absolute_Vodka
AbsoluteCitron
AfterShock
AntoninRodet
Anubis
Argento
Aspall
Bacardi
BadiaAColtribuono
EXIT
Bailey's
Baltika
BarcardiLemon
Barolo
Bass
Done
Internet

Cadbury_Hot

CaffeineFree_Coca Cola

Coca-cola zero_bottle

CocaCola_can

coca-cola-bottle

Coca-ColaLime

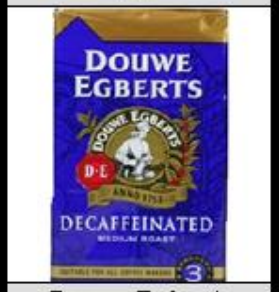
Coca-ColaLime_bottle

coca-colaZero

CoffeeMate

Diet_CocaCola

DietCherryCoke



DouweEgberts

DrPepper

EarlGrey

Fanta_Tropical

EXIT

JavadAlcohol_12

Speed

Estimated Possible Score: 24

Scor

3000

0

Click on me to return to menu

Speed

Estimated Possible Score: 5

Score

3000

0

Click on me to return to menu

CLICK HERE TO SEE THE RESULTS

JavadAlcohol_12

Speed

Estimated Possible Score: 24

Score

3000

0

Click on me to return to menu


JavadAlcohol_12
Speed
Estimated Possible Score:
24
Score
Well done!
You made fewer mistakes than the allowed limit!
The game will be made a little more difficult on the next run.
Now you may save your results, or continue.
23
1635
IMPORTANT:
If you wish to save the results of this task, please click on the 'SAVE DATA' button. >
SAVE DATA
To continue with another turn, click on the 'CONTINUE' button. >
CONTINUE
Click on me to return to menu
Click here to hide Results.
Minimum speed for this stage: 1635
Minimum score required: 21
Mean Response Times
Alcohol
941
Soft
914
Alcohol Distractibility
27
Number of failures
Alcohol
0
Soft
1
Failure Index
-1

Promising CBM-A

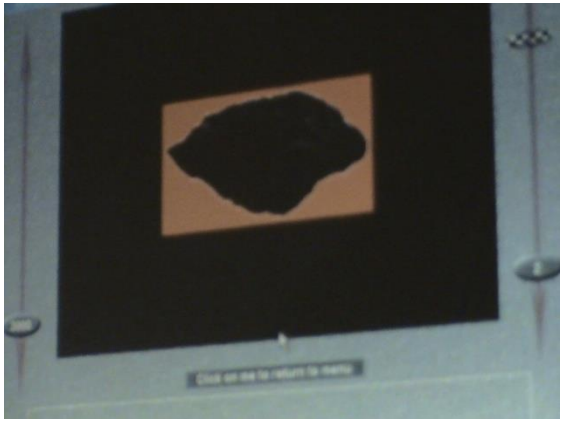
- Most of the CBM-A addressed alcohol abusers' implicit cognitive reactions to alcohol-related stimuli (Fadardi & Cox, 2009; Cox et al., 2011; Schoenmakers, Wires, Jones, Bruce & Jansen, 2006; Wiers et al., 2006, 2008)
- One study with Overweight and Obese Dieters (Bazzaz, Fadardi, Cox, Parkinson, 2017)

Drug-ACTP?

- Only ONE prior intervention on drug-related stimuli among drug abusers in MMT (Ziaee, Fadardi, & Cox, & Yazdi 2016)

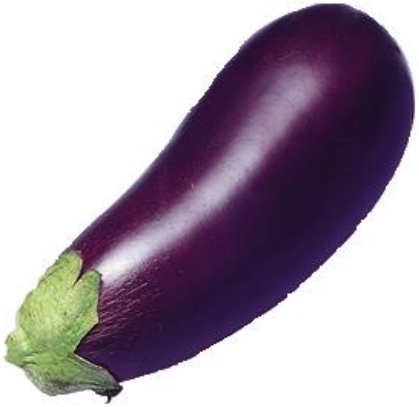
- The present study was the first attempt to test the effectiveness of Drug-ACTP on **detoxified** drug-abusers' attentional bias and treatment indices.

Sample of drug-related and alternative stimuli in the drug-ACTP

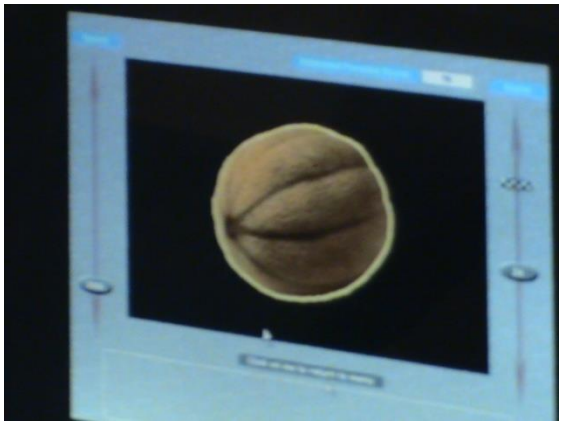


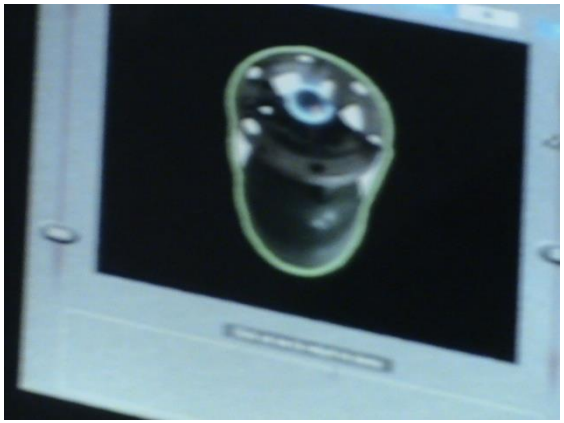
Samples of salient stimuli for drug abusers

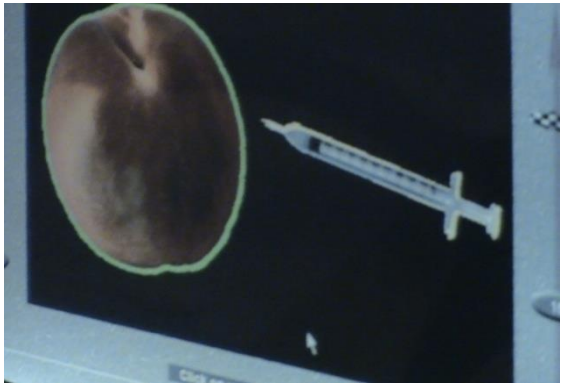
Samples of alternative stimuli for drug abusers



Single and paired presentation of the stimuli



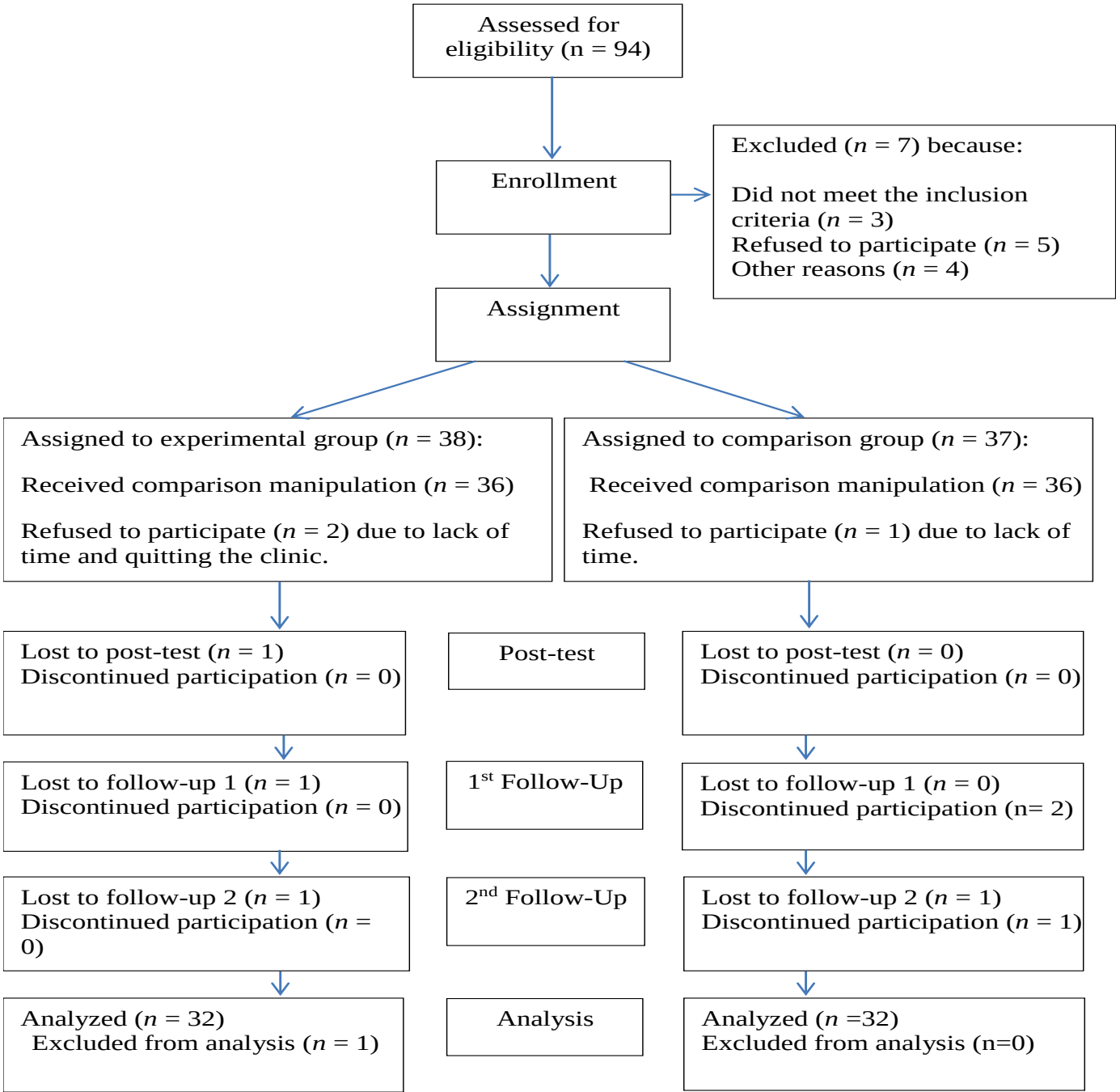




	Control Group	Experimental group
Pre-test	Yes	Yes
Drug ACTP (three weks)	----	Yes
Post-test: week 4	Yes	Yes
Follow-up: Six months	Yes	Yes

Note. Each Drug-ACTP training session lasted about 50 minutes with 4-5 training episodes dispersed for 2-3 minutes

Figure 1. Flow of participants in the study



Instruments

1. The Drug Abuse Temptation scale (Fadardi & Barerfan, 2011)
2. Positive and Negative Affect Schedule (Watson et al., 1988)
3. Perceived Stress Scale (Cohen et al., 1983).
4. Readiness to Change Questionnaire (Heather et al., 1993)
5. Situational Confidence Questionnaire (Annis & Graham, 1988)
6. Intervention evaluation form (Fadardi, 2003)
7. Follow-up Telephone Questionnaire
8. Saliva test (Peck, 1959)
9. Stroop test:
   - Drug-related (opium, alcohol, cigarette)
   - drug-unrelated (table, dress, door)
   - Goal-related words (family, love, health)

Peck's Method for Collecting Saliva in response to blocks of drug-related vs. control stimuli (passive observation)

Classic stroop

Emotional Stroop

The results of MANCOVA models testing for changes in the experimental and control groups' drug-related, concern-related, and classic **Stroop interference scores** and the number of errors in classic-Stroop from pre-test to post-test and follow-up.

			Covariates				Change indices			
		Group	age	education	No. of withdrawals	Pre-Classic Int.	Exp	Ctrl		
Model		F(1,62)(*p*)η2	F (*p*)η2	F (*p*)η2	F (*p*)η2	F (*p*)η2	M	M	Se Diff	Pairwise results
Drug-Stroop	T_2 -T_1	8.75(0.005)0.139	0.007(0.93)0.00	1.19(0.28)0.02	2.23(0.14)0.04	8.11(0.006)0.13	-21.76	32.80	18.45	Ex< Ctrl
	T_3 -T_1	5.04(0.029)0.085	0.10(0.75)0.00	8.16(0.006)0.13	1.42(0.28)0.03	0.08(0.78)0.03	-21.16	20.36	18.49	Ex< Ctrl
Concern-Stroop	T_2 -T_1	(0.44)	(0.59)	(0.39)	(0.23)	(0.78)				
	T_3 -T_1	(0.26)	(0.58)	(0.071)	(0.74)	(0.45)				
Classic-Stroop	T_2 -T_1	(0.65)	(0.46)	(0.48)	(0.47)					
	T_3 -T_1	(0.79)	(0.94)	(0.96)	(0.074)					
No. errors Stroop	T_2 -T_1	(0.12)	(0.035)	(0.99)	(0.59)					
	T_3 -T_1	5.33(0.025)0.09	1.35(0251)0.02	3.37(0.073)0.06	0.13(0.72)0.00		-3.65	1.04	2.04	Ex<Ctrl

POST-TEST MANCOVA *Testing Groups' drug temptation, readiness to change, positive and negative affect, perceived stress, and SCQ*

Model		Group			Covariates			Change indices			
					No. of detoxifications	education	age	Ctrl	Exp	*Se* Diff	Pairwise results
		F (1,62)	*p*	η2	F (*p*) η2	F (*p*) η2	F (*p*) η2	M	M		
Drug temptation	T2-T1	7.29	0.009	0.11	(0.76)	4.88(0.03)0.079	(0.35)	-16.81	-0.80	5.93	Exp > Ctrl
	T3-T1		0.18		(0.40)	(0.47)	(0.50)				
RTC: total score	T2-T1		0.11		(0.54)	(0.48)	(0.29)				
	T3-T1		0.40		(0.97)	(0.84)	(0.91)				
Positive affect	T2-T1		0.30		4.60(0.036)0.076	(0.69)	(0.70)				
	T3-T1		0.57		(0.1)	(0.34)	(0.80)				
Negative affect	T2-T1	8.32	0.006	0.13	(0.60)	(0.8)	(0.86)	-11.18	-4.00	2.08	Exp > Ctrl
	T3-T1		0.092		(0.28)	(0.66)	(0.60)				
Perceived stress	T2-T1	11.60	0.001	0.17	(0.39)	(0.33)	(0.25)	-8.18	-1.50	1.96	Exp > Ctrl
	T3-T1	4.52	0.038	0.073	(0.70)	(0.72)	(0.16)	-3.83	-3.75	2.39	Exp > Ctrl
SC: total score	T2-T1		0.91		(0.73)	(0.48)	(0.25)				
	T3-T1		0.57		(0.42)	(0.49)	(0.36)				
SC: pleasant emotions	T2-T1		0.40		(0.20)	(0.75)	(0.40)				
	T3-T1		0.89		(0.064)	(0.13)	(0.89)				
SC: unpleasant emotions	T2-T1		0.076		(0.97)	(0.67)	(0.076)				
	T3-T1		0.61		(0.58)	(0.25)	(0.61)				
SC: urges and temptations	T2-T1		0.76		(0.42)	(0.55)	(0.76)				
	T3-T1		0.64		(0.097)	(0.079)	(0.63)				
SC: positive social situations	T2-T1	6.37	0.014	0.10	(0.95)	(0.26)	1.11(0.01)0.019	0.31	0.27	0.25	Exp > Ctrl
	T3-T1		0.29		(0.88)	(0.69)	(0.29)				
SC: social tension	T2-T1		0.49		(0.18)	(0.81)	(0.49)				
	T3-T1		0.82		(0.47)	(0.76)	(0.82)				
SC: Social problems at work	T2-T1	5.019	0.029	0.081	(0.58)	(0.25)	5.02(0.029)0.081	0.13	0.098	0.22	Exp > Ctrl
	T3-T1		0.075		(0.68)	(0.55)	(0.075)				
SC: testing personal control	T2-T1		0.95		(0.17)	(0.22)	(0.95)				
	T3-T1		0.44		(0.29)	(0.66)	(0.44)				
SC: physical discomfort	T2-T1		0.19		3.99(.051)0.065	(0.89)	(0.19)				
	T3-T1		0.73		(0.27)	(0.73)	(0.73)				

6-month follow-up MANCOVA *Testing Groups' drug temptation, readiness to change, positive and negative affect, perceived stress, and SCQ*

Posttest score	Group	Covariate: pretest score	Exp	Ctrl	*Se* Diff	Pairwise results
	F(1, 59) (p) η^2	F (*p*) η^2	M	M		
Temptation	42.67(0.001)0.43	(0.14)	4.70	8.82	0.43	Exp > Ctrl
SC	5.99(0.018)0.09	(0.096)	10.09	8.35	0.50	Exp > Ctrl
Positive affect	2.91(0.093)0.047	(0.41)	4.09	3.60	0.28	
Negative affect	5.11(0.027)0.08	6.66(0.012)0.10	2.11	2.75	0.28	Exp > Ctrl
Perceived stress	11.57(0.001)0.16	(0.40)	7.40	5.88	0.45	Exp > Ctrl
RTC	0.029(0.86)0.001	(0.90)	6.50	6.56	6.07	

Note: Exp = Experimental group; Ctrl = Control group; RTC = Readiness to Change; SC = Situational Confidence

Medication Dose

0 = No Change or Increase in Dose of Medication
1= No or reduced does of Medication

Six month follow-up						
	Experimental Group			Control Group		
Post-test		0	1		0	1
	0	1	5	0	5	3
	1	9	15	1	13	8

The results of MANCOVAs model testing for changes in the experimental and control groups' **salivation response** from pre-test to post-test and the follow-up.

		ange indices		
	Group		Se	Pairwise
Model	F(1,62)(*p*)η2		Diff	results
T_2 -T_1	4.361(0.041)0.070	33	0.141	Ctrl<Exp
T_3 -T_1	0.351(0.0556)0.06	1	0.174	

Lapse and Relapse

t-test on 4-week relapse (p = .012.)

t-test on 4-week lapses (p = 0/010)

Participants' Evaluation of the Program (not blind)

Useful = %96

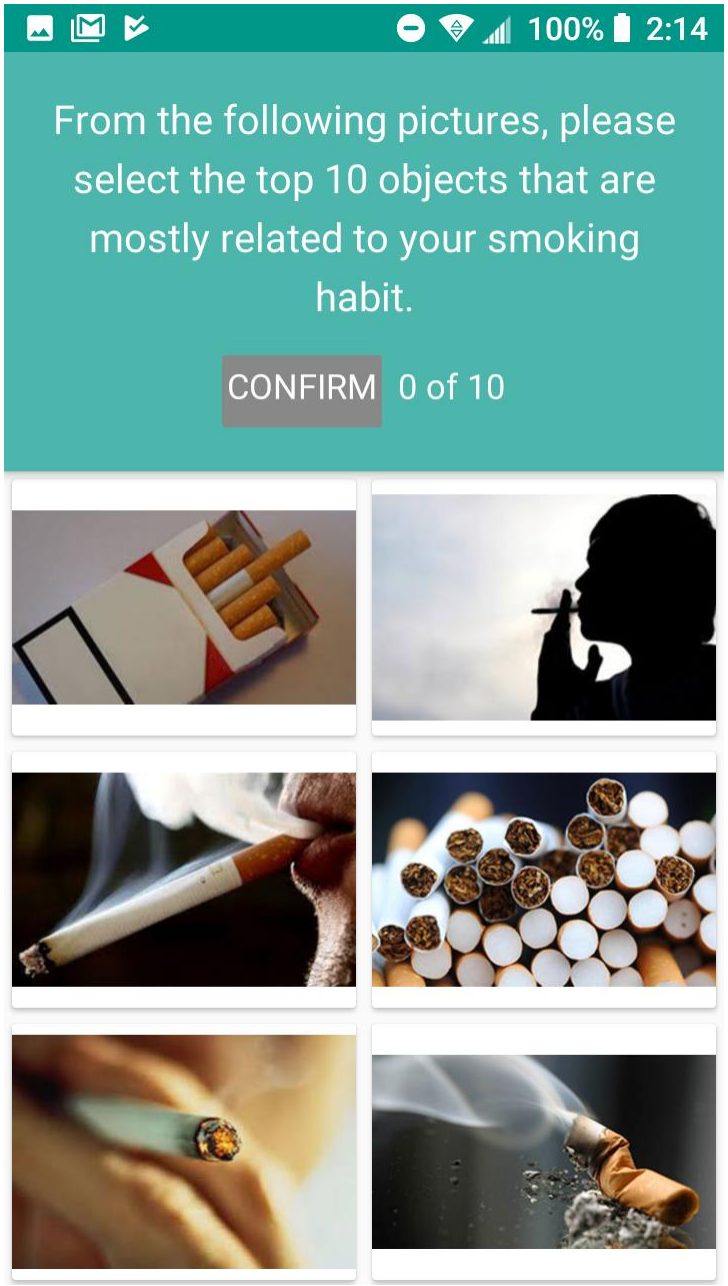
Helping reduce dependence on medication = %87

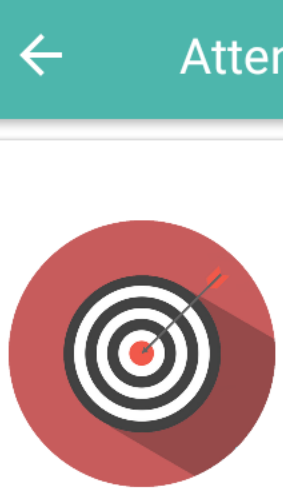
Helping reduce hypersensitivity to drug-related cues = %67

Helping reduce rumination with drugs and use = %64

Attention Retraining Cellphone App

Attention Retraining

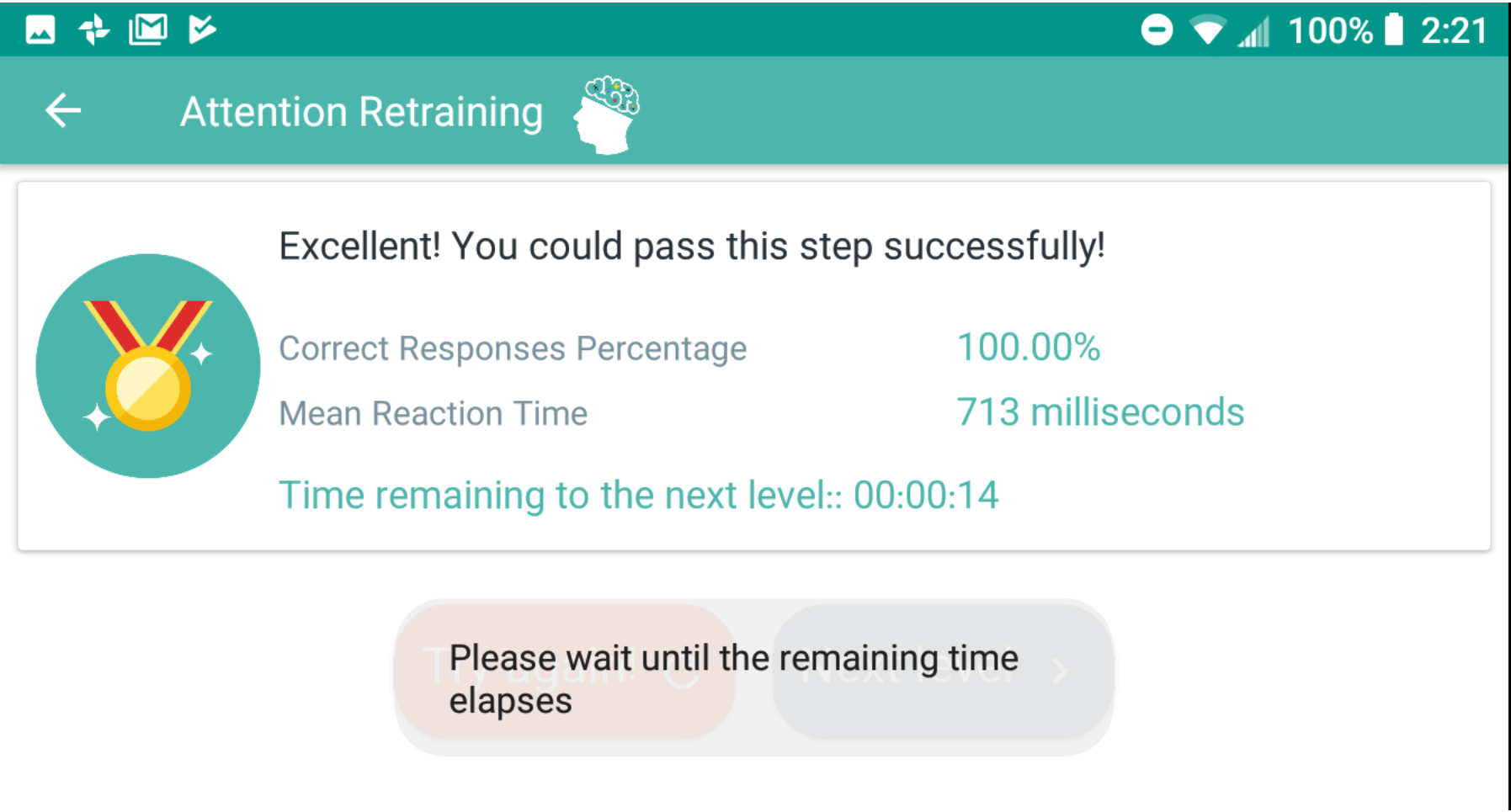

100% 2:14
From the following pictures, please select the top 10 objects that are mostly related to your smoking habit.
CONFIRM
0 of 10



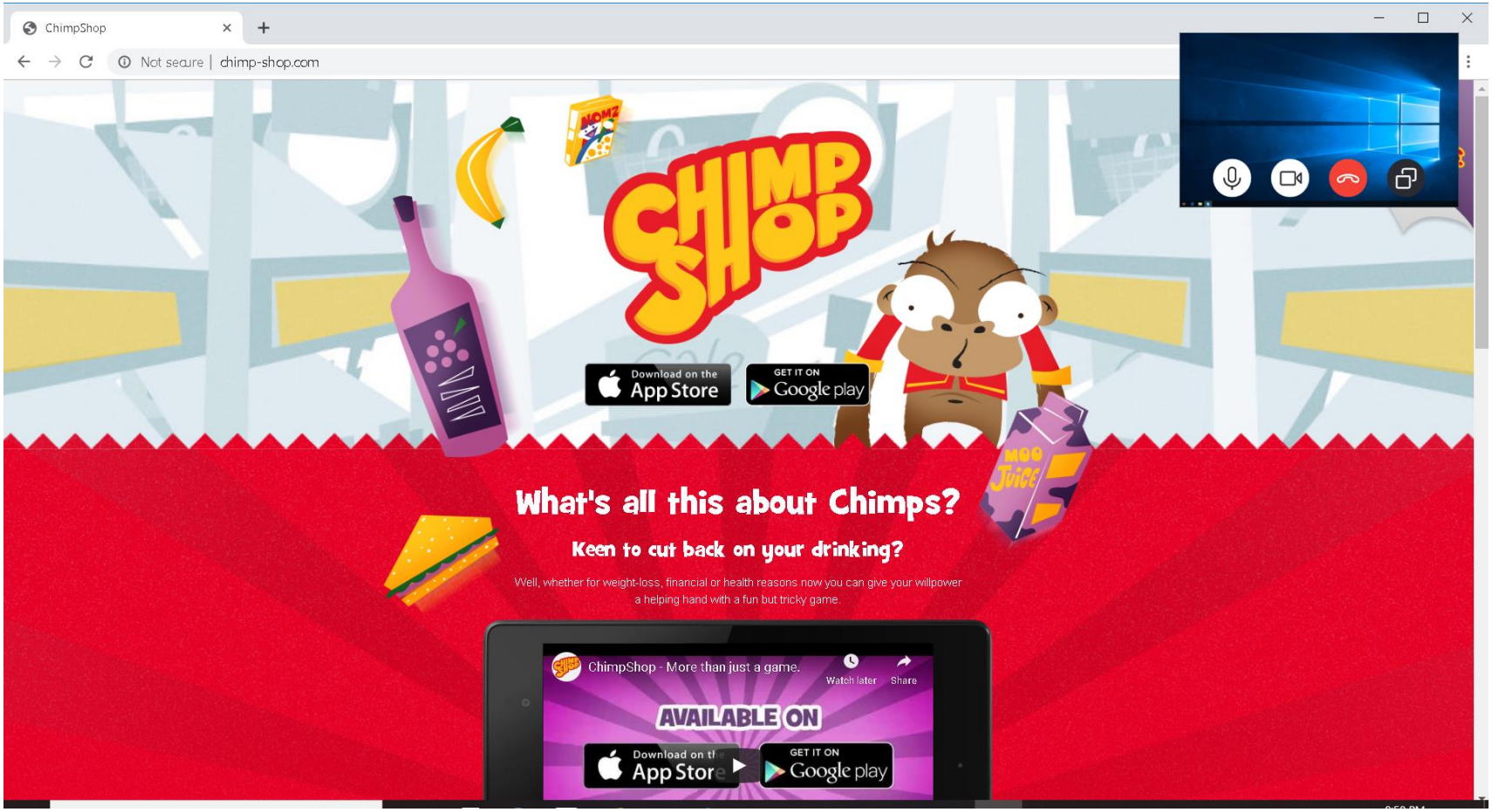
Nice try! However, you need less mistakes to get a pass score to the next step. Please try again.

Correct Responses Percentage	78.57%
Mean Reaction Time	676 milliseconds

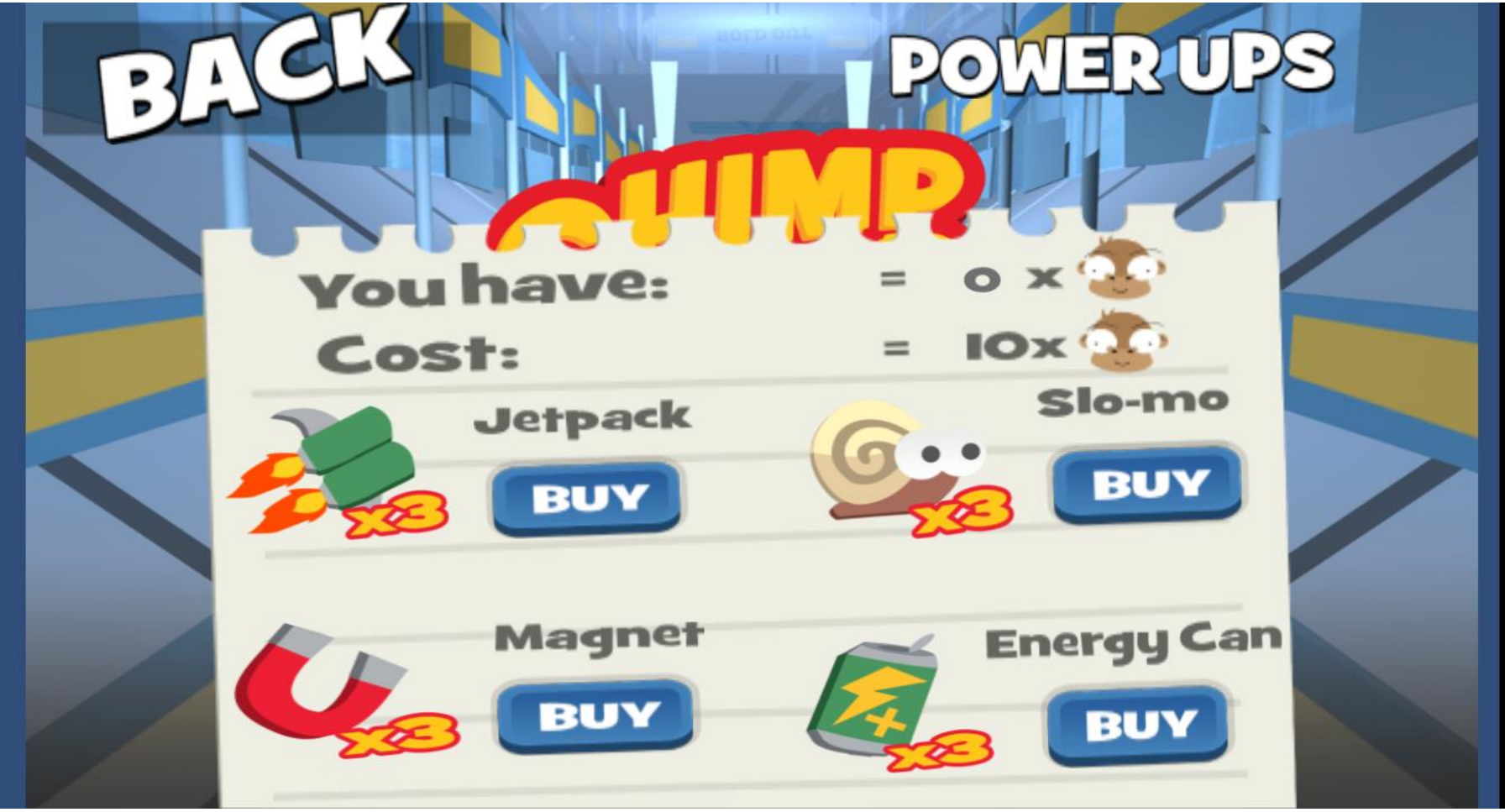
Try again!


100% 2:21
Attention Retraining
Excellent! You could pass this step successfully!
Correct Responses Percentage 100.00%
Mean Reaction Time 713 milliseconds
Time remaining to the next level:: 00:00:14
Please wait until the remaining time elapses

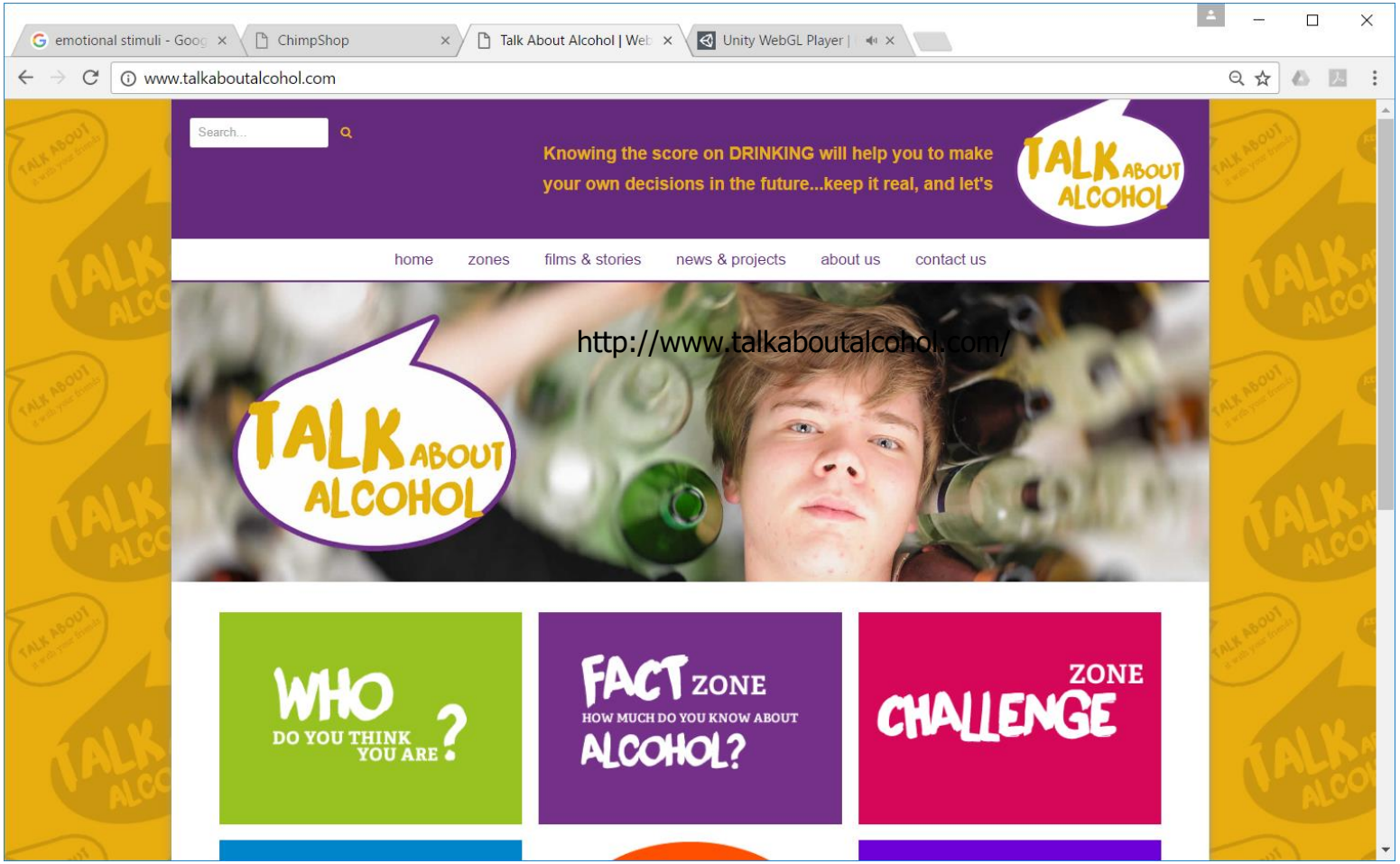
Attention Retraining Web-Based Game: ChimpShop




CHIMP SHOP
TAP TO PLAY
SHOP
AWARDS
FREE
1
2
3
RANKING


BACK
POWER UPS
JUMP
You have:
= 0 x
Cost:
= 10x
Jetpack
x3
BUY
Slo-mo
x3
BUY
Magnet
x3
BUY
Energy Can
x3
BUY

Adding ChimShop to talkaboutalcohol.com



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FOR YOUR
ATTENTION