

Alcohol and memory for sexual assault: The effect of alcohol intoxication on lineup identification accuracy and the confidence-accuracy relationship

Heather D. Flowe, PhD



Paper presented June 2017, Nottingham Trent University, 'Advancing advocacy: Challenges ahead in evidence and procedure'.

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Presentation based on:

Flowe, H. D., Colloff, M. F., Karoğlu, N., Zelek, K., Humphries, J. E., & Takarangi, M. K. T. (In press). The effects of alcohol intoxication on accuracy and the confidence-accuracy relationship in photographic simultaneous lineups. *Applied Cognitive Psychology*.

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# ALCOHOL AND SEXUAL ASSAULT

- Sexual violence often occurs in and around drinking establishments (e.g., Anderson, Hughes, & Bellis, 2007)
- Rape perpetrators seem to target people who are alcohol-intoxicated (Lisak & Miller, 2002)



# LONDON BRIDGE ATTACK



- People frequently witness violent crime while drinking alcohol

# PROBATIVE ASPECTS OF ALCOHOL

- More than 300 individuals, mostly convicted of sex offences have been exonerated based on DNA evidence (<https://www.innocenceproject.org>)
- If alcohol decreases accuracy, is a complainant's testimony about a sexual assault reliable if she was alcohol-intoxicated during the attack?



# WHAT DO WE KNOW ABOUT ALCOHOL AND MEMORY IMPAIRMENT?

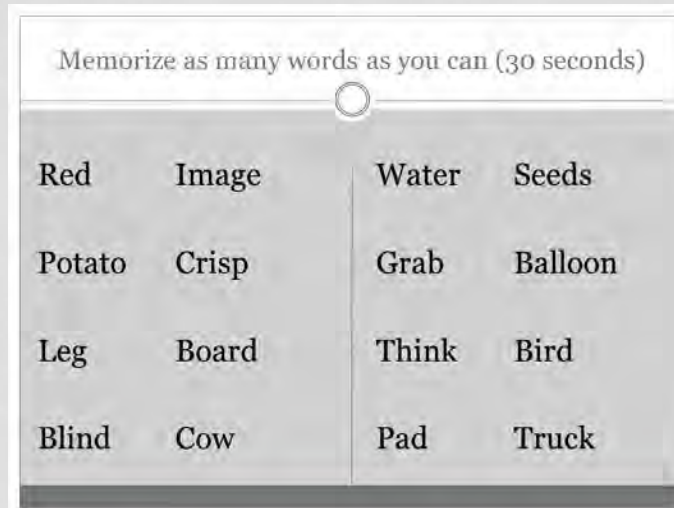
‘Based on my personal experience, alcohol is bad for your memory.’





# WHAT DO WE KNOW ABOUT ALCOHOL AND MEMORY IMPAIRMENT?

Basic research on memory and cognition finds that alcohol impairs memory



But, in lab tests – the participant has no control over their ‘test output’ – memory is exhaustively tested.

During police interviews, people control and regulate their testimony (Weber & Brewer, 2008)

# WHAT DO WE KNOW ABOUT ALCOHOL AND MEMORY IMPAIRMENT?

In evaluating the effect of alcohol on memory, *completeness* and *accuracy* must be distinguished:

Table 1. Number of correctly recalled details and errors for the three groups on the free and cued recall test, during session 1 (T1) and the follow-up test (T2)

	Sober (n = 14)		Moderately intoxicated (n = 27)		Severely intoxicated (n = 26)	
	T1	T2	T1	T2	T1	T2
Free recall story						
Correct total	14.15 (4.93) <sup>a,b</sup>	13.30 (4.31) <sup>a,b</sup>	11.18 (3.51) <sup>c</sup>	10.07 (3.51) <sup>c</sup>	6.23 (3.59)	5.90 (3.20)
Errors (com/dis)	1.76 (1.16)	1.92 (1.38)	1.88 (1.36)	1.70 (1.26)	2.04 (2.26)	1.23 (1.04)
Free recall actions						
Correct total	8.38 (5.31) <sup>a,b</sup>	12.93 (5.57) <sup>a,b,*</sup>	5.70 (3.97)	7.88 (4.21)*	5.04 (2.72)	7.42 (4.35)*
Errors (com/dis)	0.31 (0.48)	0.76 (0.83)	0.18 (0.48)	0.92 (1.46)	0.47 (0.81)	0.61 (0.92)
Cued recall story						
Correct total	2.71 (0.91)	2.50 (1.16)	2.44 (1.25)	2.29 (1.20)	2.03 (1.39)	1.80 (1.47)
Errors (com/dis)	1.14 (0.94)	1.35 (1.00)	1.18 (1.37)	1.14 (1.09)	1.69 (1.37)	1.65 (1.44)
Cued recall actions						
Correct total	11.71 (1.47) <sup>b</sup>	12.35 (1.90) <sup>b</sup>	10.59 (2.37) <sup>c</sup>	10.51 (1.98)	8.80 (2.36)	10.03 (3.05)*
Errors (com/dis)	0.42 (0.85)	0.21 (0.80)	0.62 (1.00)	0.05 (1.06)	1.23 (1.72)	1.11 (1.27)

From: OORSOUW\*, H. MERCKELBACH, & SMEETS, 2015

# INTOXICATED PARTICIPANTS ENGAGE IN A QUANTITY-ACCURACY TRADE-OFF

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## Intoxicated Eyewitnesses: Better than Their Reputation?

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According to the well-known source-monitoring model of memory, the accuracy of eyewitness testimony is affected by the quality of the source information. In this study, we tested whether intoxicated eyewitnesses are better than their reputation. In a laboratory study, participants watched a staged video of a crime and were then interviewed about the details of the crime. The results showed that intoxicated participants performed better than their reputation on a recognition test, but worse than their reputation on a free recall test. These findings suggest that intoxicated participants are better at recognizing details than they are at recalling details. This result has implications for the legal system, as it suggests that intoxicated witnesses may be better at recognizing details than they are at recalling details. This result has implications for the legal system, as it suggests that intoxicated witnesses may be better at recognizing details than they are at recalling details.

Keywords: intoxicated, eyewitness, accuracy, alcohol, perception, effects.

Witnesses and victims often provide crucial leads to criminal investigations (Fisher, 1995; Fisher & Schooler, 2007). According to a model of eyewitness memory, the accuracy of eyewitness testimony is affected by the quality of the source information. In this study, we tested whether intoxicated eyewitnesses are better than their reputation. In a laboratory study, participants watched a staged video of a crime and were then interviewed about the details of the crime. The results showed that intoxicated participants performed better than their reputation on a recognition test, but worse than their reputation on a free recall test. These findings suggest that intoxicated participants are better at recognizing details than they are at recalling details. This result has implications for the legal system, as it suggests that intoxicated witnesses may be better at recognizing details than they are at recalling details.

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This article was published Online First February 10, 2011.  
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Applied Cognitive Psychology, Appl. Cognit. Psychol., 30, 270–281 (2016)  
Published online 11 January 2016 in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/acp.3209

## Intoxicated Witnesses: Testing the Validity of the Alcohol Myopia Theory

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**Summary:** In an assessment of the Alcohol Myopia Theory (AMT), the effects of alcohol on an eyewitness's recall of high-salience and low-salience details were investigated. In a laboratory study 1 participants watched a staged video of a crime and were then interviewed about the details of the crime. The results showed that intoxicated participants performed better than their reputation on a recognition test, but worse than their reputation on a free recall test. These findings suggest that intoxicated participants are better at recognizing details than they are at recalling details. This result has implications for the legal system, as it suggests that intoxicated witnesses may be better at recognizing details than they are at recalling details.

Applied Cognitive Psychology, Appl. Cognit. Psychol., 26: 82–90 (2012)  
Published online 2 May 2011 in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/acp.1799

## The Effects of Alcohol on Crime-related Memories: A Field Study

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Forensic Psychology Section, Maastricht University, Maastricht, The Netherlands

**Summary:** This field study investigated to what extent memory of criminally relevant details is affected at (close to) zero ( $M_{BAC} = 0.00\%$ ), moderate ( $M_{BAC} = 0.06\%$ ), and high ( $M_{BAC} = 0.16\%$ ) levels of alcohol intoxication. Participants ( $N = 76$ ) were approached in bars and concentration levels. After crime. Compared with sober controls, intoxicated participants produced less accurate recall of crime details. Implications for the legal system are discussed.

Scandinavian Journal of Psychology, 2013, 54, 188–195

DOI: 10.1111/sjop.12035

## Cognition and Neurosciences

### Bottled memories: On how alcohol affects eyewitness recall

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Hagsand, A., Hjelmåster, E. R. A., Granhag, P. A., Fahlke, C. & Söderpalm-Gordh, A. (2013). Bottled memories: On how alcohol affects eyewitness recall. *Scandinavian Journal of Psychology*, 54, 188–195.

This study investigated how different doses of alcohol affected eyewitness recall. Participants ( $N = 126$ ) were randomly assigned to three groups with different blood alcohol concentration (BAC), either a control group (mean BAC 0.00%,  $N = 42$ ), a lower alcohol dose group (mean BAC 0.04%,  $N = 40$ ), or a higher alcohol dose group (mean BAC 0.06%,  $N = 44$ ). After consumption, participants witnessed a movie of a mock crime and were interviewed one week later. The main results showed that witnesses with the higher intoxication level recalled fewer details compared to witnesses with the lower intoxication level. The amount of alcohol consumed did not have an impact on the accuracy rate. No sex differences were found. The results are discussed in the light of past research. We conclude that more studies are needed before recommendations can be made to an applied setting.

**Key words:** Alcohol, eyewitness memory, recall, delayed interview, intoxicated witnesses.

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# TWO VIEWS ON CONFIDENCE-ACCURACY RELATIONSHIP

- The Optimality Hypothesis (Deffenbacher)
  - Confidence is predictive of accuracy under optimal conditions (e.g., learning is strong, retention interval is short)
- Information Theory (Palmer et al.)
  - When learning conditions are salient, confidence is predictive because participants will take into account theory-based information about factors that might diminish accuracy

# PREDICTIONS

- Alcohol consumption during encoding will decrease lineup identification accuracy
- Under the 'optimality hypothesis', confidence will be less predictive of accuracy for participants who were intoxicated during encoding
- Under the 'information theory' hypothesis, confidence will be more predictive of accuracy for participants who were intoxicated during encoding

# PARTICIPANTS



- 153 women between the ages of 18 and 32 ( $M = 20.38$ )

# DESIGN

- We ran a 2 beverage (alcohol or tonic) x 2 expectancy (told alcohol or told tonic) x 2 perpetrator (present or absent in lineup) factorial design
- Women were randomly assigned to a condition

To control beverage:

- In the alcohol group, women received vodka, tonic and limes, and they were dosed to achieve an average BAC of .075%
- In the tonic group, women were given tonic water and limes that were soaked in vodka

To control expectancy:

- Half of the participants in each beverage group were told they had received vodka, and the other half were told they had received tonic.

# DESIGN

- Measures
  - Lineup identification outcome (perpetrator, filler, reject)
  - Identification confidence (7 point Likert-type scale)
- Full ethical approval
  - Followed BPS ethics requirements
  - Informed consent procedures utilised
- For generalizability purposes, 4 different perpetrators, each participant saw one of them



# PERPETRATOR



# SCREENING



- Medical conditions
- Medication
- Problem drinking behaviours
- Pregnancy

## Stage 1

Screening

## Stage 2 Experiment

Beverage  
And  
Expectancy  
Manipulation

Interactive  
Scenario

## Stage 3



24 hours or  
7 days later



**1**



**2**



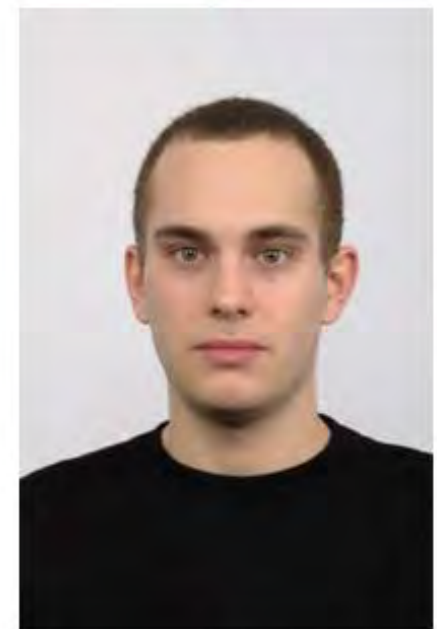
**3**



**4**



**5**



**6**



Finally, all participants were fully debriefed regarding the aims of the study.

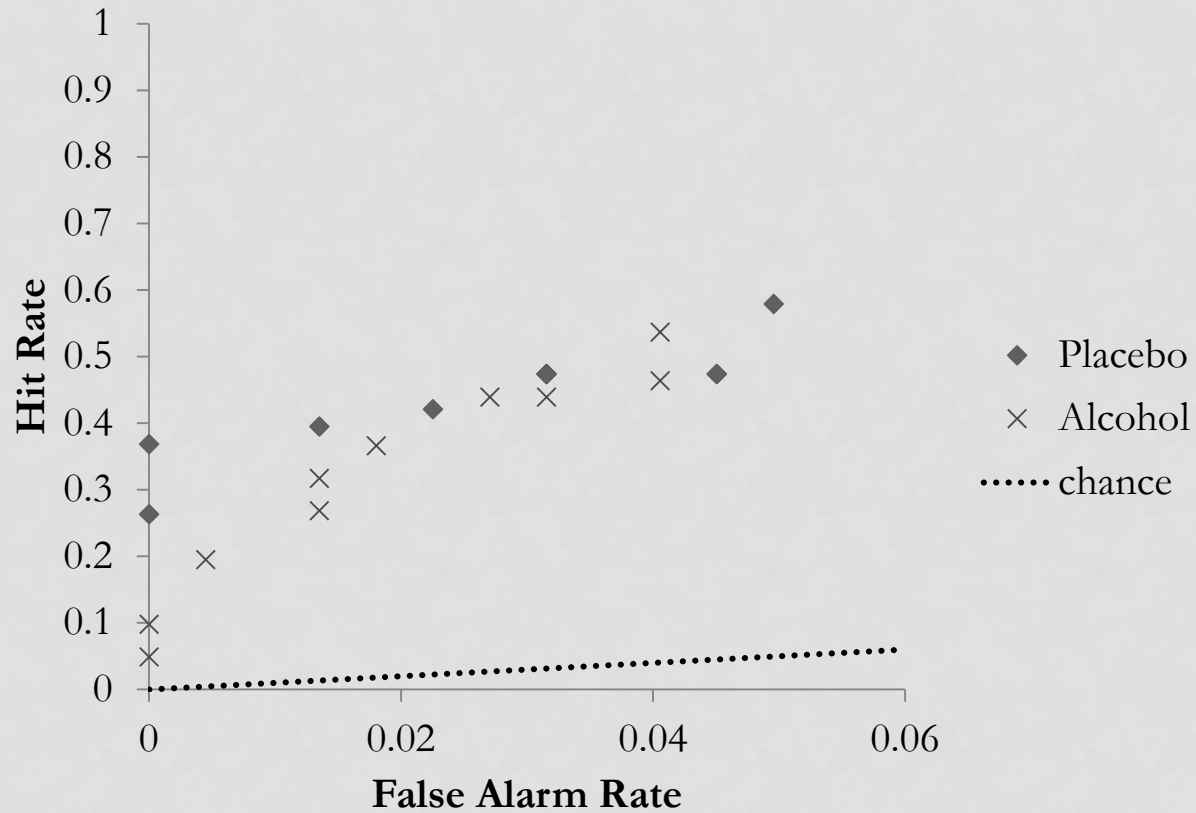
# IDENTIFICATION OUTCOMES

*Proportions of Identification Responses by Beverage Group, Expectancy, and Identification Outcome*

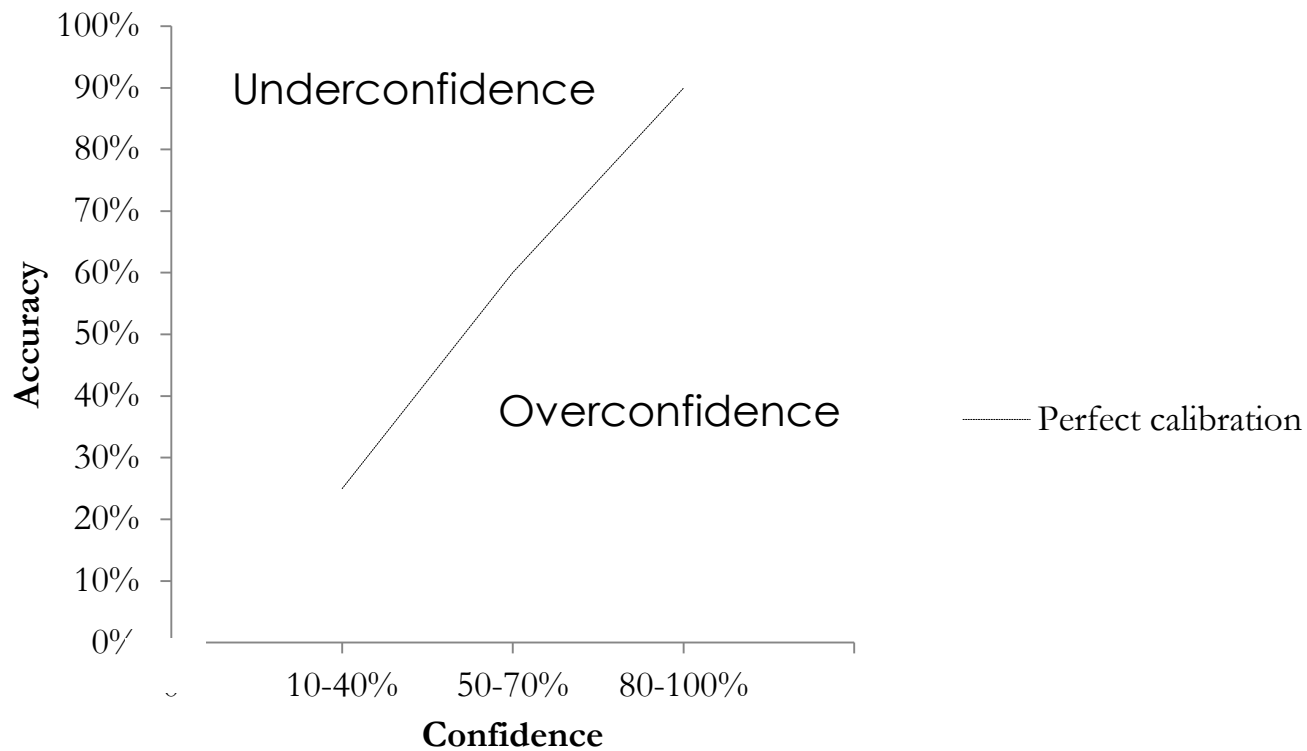
EXPECTED ALCOHOL			EXPECTED TONIC WATER		
Consumed Tonic Water			Consumed Tonic Water		
	PP ( <i>n</i> = 23)	PA ( <i>n</i> = 17)		PP ( <i>n</i> = 15)	PA ( <i>n</i> = 20)
perpetrator	0.61	--	perpetrator	0.53	--
filler	0.09	0.41	filler	0.07	0.20
reject	0.30	0.59	reject	0.40	0.80
Consumed Alcohol			Consumed Alcohol		
	PP ( <i>n</i> = 19)	PA ( <i>n</i> = 21)		PP ( <i>n</i> = 23)	PA ( <i>n</i> = 17)
perpetrator	0.42	--	perpetrator	0.63	--
filler	0.16	0.19	filler	0.17	0.31
reject	0.42	0.81	reject	0.32	0.69

*Note.* PP = Perpetrator present; PA = Perpetrator absent

# ALCOHOL CONSUMPTION AND ACCURACY

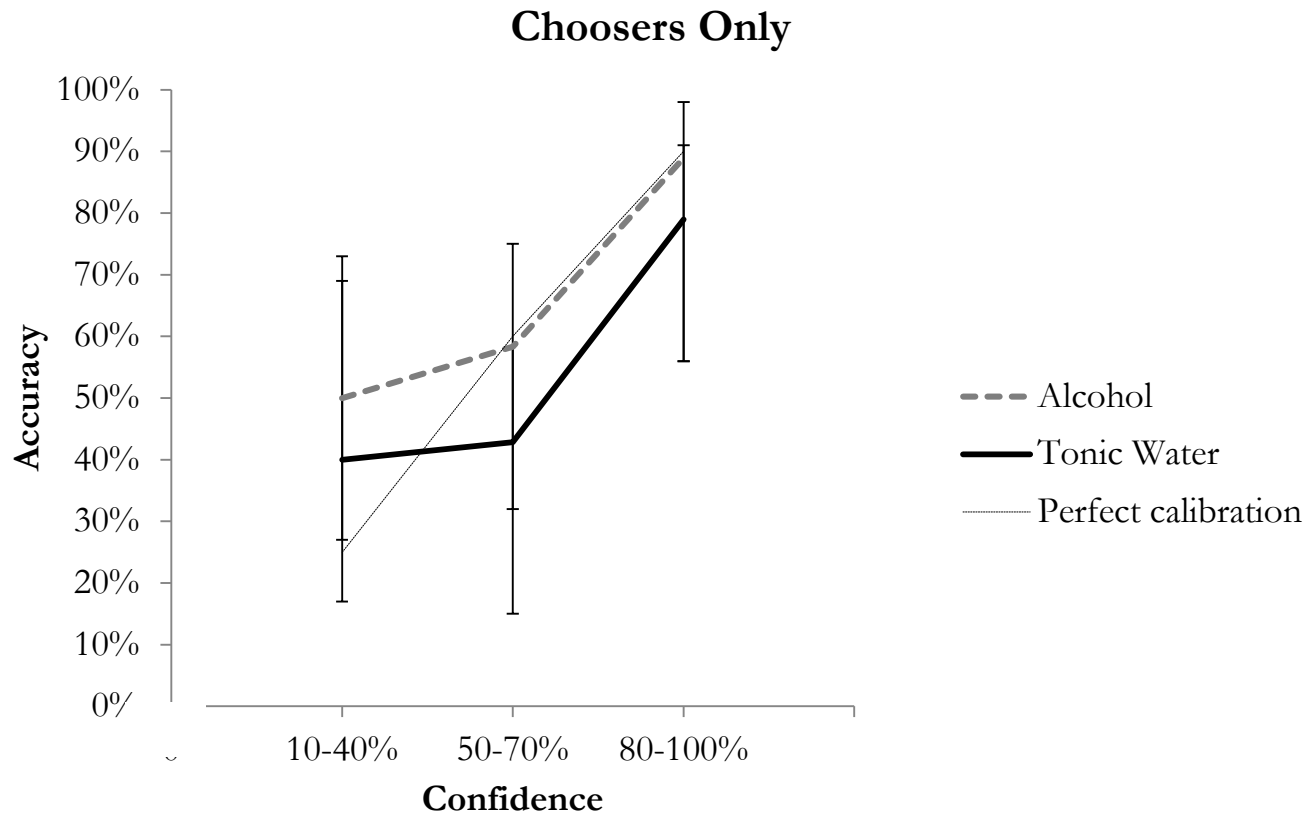


# CONFIDENCE-ACCURACY CALIBRATION



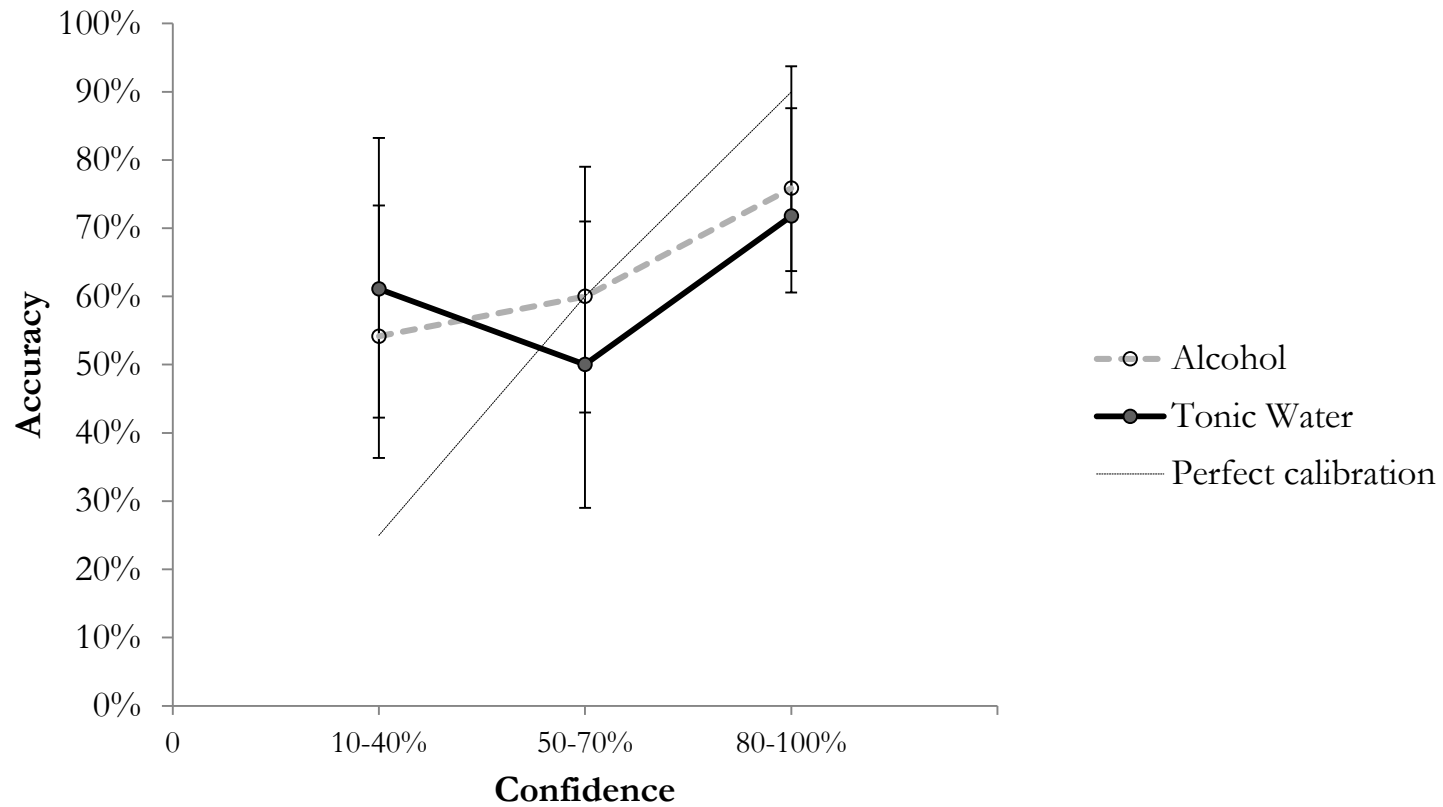


# CONFIDENCE-ACCURACY RELATIONSHIP



# CONFIDENCE-ACCURACY RELATIONSHIP

## Choosers and Nonchoosers



# CALIBRATION STATISTICS

*Calibration Statistics by Beverage Group, Choosers and Nonchoosers Combined*

	Tonic Water			Alcohol		
	Value	Jackknife <i>SE</i>	95% CI	Value	Jackknife <i>SE</i>	95% CI
O/U	-0.32	0.06	-0.43 to -0.20	-0.4	0.06	-0.52 to -0.28
C	0.07	0.15	-0.22 to 0.36	0.04	0.12	-0.17 to 0.27
NRI	0.03	0.03	-0.03 to 0.09	0.04	0.05	-0.06 to 0.14

# SUMMARY

- Alcohol consumption at encoding did not decrease identification accuracy 24 hours or 7 days later
- Alcohol consumption at encoding did not affect confidence-accuracy calibration
- The confidence-accuracy data were more in line with information theory than with the optimality hypothesis, suggesting alcohol consumption reduces overconfidence

# IMPLICATIONS AND FUTURE DIRECTIONS

- Larger doses of alcohol should be studied so that we can more easily generalise
  - Field research needed, though perhaps will have to tradeoff scenario realism and not use a rape vignette for ethical purposes
- Further research should examine judgments of learning and showup accuracy, as showups are still widely used, particularly in the US

# IMPLICATIONS AND FUTURE DIRECTIONS

- The testimony of Intoxicated witnesses should not be automatically discounted
- The results of this study align with several others, showing that accuracy does not differ depending on intoxication at encoding

# 'NEW EVIDENCE FOR PRACTICE' CONFERENCE

Conference:

- *Interviewing Intoxicated Victims: New Evidence for Practice*
- July 17<sup>th</sup> @ Leicester Police HQ

Get in touch if you would like further information about the paper:

@hflowe on Twitter

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Email me if you would like to attend the conference

(Space is limited – only 10 out of 100 places remaining  
as of this morning!)