Alcohol and performance: a pilot field study

Richard Mayes, Brian Tiplady, Andrew Scholey
Human Cognitive Neuroscience Unit,
Northumbria University, Newcastle upon Tyne NE1 8ST, UK

Background
- The effects of alcohol intoxication on laboratory measures of cognitive performance and mood are well documented.
- Given the widespread use of alcohol, and current concerns regarding its social impact, there is a surprising paucity of field research in this area.
- The current pilot study aimed to assess the effects of drinking in a natural setting on aspects of performance.

Methods
- Thirty individuals were approached and tested individually in a bar on the university campus.
- Each was breathalysed before and following completion of a computerised test battery.
- They provided details of alcoholic drinks consumed and length of time since their first drink. They were also asked to record information regarding other recreational drug use.
- A short test battery was administered on a handheld Newton computer (www.penscreen.com).
- The battery consisted of a series of measures previously shown to be sensitive to ethanol intoxication in laboratory studies1 including:
  - Rectangular maze
  - Serial Sevens
  - General Knowledge Adaptive
  - Handwriting
  - Visual Analogue mood scales

Results

Intoxication measures
As predicted there were highly significant correlations between blood alcohol content (BAC) and both 1. estimated number of units consumed and 2. time since first alcoholic drink.

Visual analogue scales
BACs were also significantly correlated with
- sober-drunk ratings
- alertness ratings

Performance measures
Participants were divided into two groups according to whether their individual mean BACs were lower than (X = .037 ± .025 mg/100ml) or higher than (X = .180 ± .065 mg/100ml) the UK legal drink-driving limit (see raw data, right).
- Both correlational analyses and comparison of scores from lower and higher BAC groups revealed a characteristic shift in speed-accuracy trade-off2.
- Higher alcohol levels were associated with significantly more errors on the maze and Serial Sevens tasks.

Summary and conclusions
- These data confirm that patterns of alcohol impairment previously measured in the laboratory are similar to those observed in a real-life setting.
- The results suggest that laboratory studies of alcohol intoxication have ecological validity.
- The effect on Serial Sevens is broadly consistent with a rare previous study which included assessment of alcohol impairment in a real-life (club) setting3. There, alcohol intoxication (reported X of 10.2 units which would correspond to a BAC of ~ 0.17 in the present study) was associated with a decreased number of subtractions in a verbal version of this task.
- The characteristic shift in speed-accuracy trade-off was maintained in this pilot field study.
- The significant differences in performance between the higher and lower drink-driving limit BACs emphasise the potential impact of alcohol on driving and related activities.
- Further work is necessary directly comparing patterns of alcohol impairment in the laboratory and in the field.

References