



# Unravelling Decision-Making in Emergency Rooms: A Noise Audit Study on Professional Nurses' Performance

Author: **David Mizzi**

*Learn how a noise audit on professional nurses in emergency rooms sheds light on the impact of time pressure and distractions on decision-making. Through twelve simulated scenarios, researchers found surprising results that could help improve performance and patient care.*

Human beings, whether they are lawyers, professors or doctors, are not perfect decision-making machines. Bounded Rationality is the theory that when humans make decisions, they are limited (or 'bounded') by their ability to process all available information. Instead, humans tend to use 'shortcuts' or generalisations when making decisions. These can lead to a number of errors which, in certain fields, could be catastrophic. An insurance company could lose millions if a wrong decision is taken, while human lives are at risk in the medical field.

Behavioural economists, political scientists, and psychologists have all tried to better understand the decision-making process in the hopes of minimising the risk of mistakes. Prof. Daniel Kahneman, a renowned

psychologist, economist, and the author of *Noise: A Flaw of Human Judgement*, claims that bias and noise are the main contributors to errors in decision-making.

Bias refers to systematic deviation from a true value. For example, an interviewer unconsciously favouring candidates from their own university is a form of bias. Noise, on the other hand, refers to the randomness in the information used when making decisions. For example, three interviewers assessing the same candidate, using the same criteria. Logically, they should all give the same score; however, they give varying scores. This variance, according to Kahneman, is due to noise – the randomness in how they process information.

Luca Bugelli, an M.A. student from the Faculty of Economics, Management and Accountancy (FEMA), wanted to see to what extent professional nurses differ in their [▶](#)

judgement of emergency case scenarios. Supervised and mentored by Prof. Vince Cassar (Head of Department at FEMA), Bugelli worked in collaboration with the Malta Emergency Nurses Association to deploy a noise audit.

'The emergency department is historically considered a bottleneck in most hospitals. Many cases filter through emergency departments, which run around the clock, historically understaffed. They must make snap decisions in a fraction of a second,' Bugelli says. 'In this pilot project, from a managerial perspective, we wanted to see how professional judgements are affected by the variance elements in an emergency room in a simulated environment.'

## CONDUCTING THE NOISE AUDIT

With the help of emergency medical consultants, Bugelli created twelve simulated scenarios where emergency nurses had to judge the triage level (preliminary assessment of patients to determine treatment urgency and nature) of specific cases. The researchers also consulted with specialised doctors to ensure that the fictional cases presented were as realistic as possible.

'We randomly assigned the nurses into three groups,' Cassar says. There were five nurses in each group. In the first group (the control), there was no time limit, so participants had ample opportunity to go through the cases. They could analyse the case and decide on the triage level from one to five (based on the latest version of the Emergency Severity Index Triage algorithm). The second group of nurses were racing against a countdown clock and had to decide before the clock ran out. The third group, besides racing against time, had to overcome the Stroop effect. This added stressor aimed to replicate the pressure found in emergency units by having participants name the colour projected on a screen while a different colour's name is spelled. This means the individual has to select the colour red, for example, while the text 'blue' appears on the screen in red ink.

To present these twelve cases to the fifteen nurses in the three different groups, the researchers used a web application, developed with the help of Dr Joel Azzopardi (senior lecturer of AI) and the Faculty of ICT.

## WORKING UNDER PRESSURE

'I expected the control group to make less errors,' explains Bugelli. Yet, the best-performing group comprised five nurses who had to work under time constraints and burdened by the Stroop effect; because they were more accurate in terms of accuracy of judgement and quality of responses. Although these research findings are inconclusive (it is hard to draw conclusions with only fifteen participants), the observed outcomes shed light on an interesting

**How are you feeling today?**

- Starting a conversation with a stranger.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Making sure others are comfortable and happy.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Creating an artwork, piece of writing, or piece of music.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Preparing for things well in advance.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Feeling blue or depressed.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Planning parties or social events.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Meeting people.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Thinking about philosophical or spiritual questions.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Letting things get onto a nerve.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Feeling stressed or worried.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Using difficult words.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely
- Synchronising with others' feelings.  Very unlikely  Somewhat unlikely  Neither likely nor unlikely  Somewhat likely  Very likely

QUIT  SUBMIT

**CASE 'N'** 00:00

**SCENARIO**  
A 57-year-old woman presents to the emergency room short of breath, gasping for air, experiencing pain similar to heart burn. She is complaining that it is making her sick to her stomach. Her co-worker gave her an alginate acid which apparently had no effect. This has been going on for the past 3 hours and the patient is still in pain (rated 7/10) and is complaining she is feeling tired. Her vital signs seem normal.

**UNDERLYING CONDITIONS**  
Patient suffers from high-cholesterol levels.

**MEDICAL HISTORY**  
Suffered a pneumonitis last year. Lately the patient suffered from mouth ulcers and has been experiencing heart burn.

- Priority 1** Immediate treatment (acute situation with immediate vital risk)
- Priority 2** Triple medical evaluation and treatment needed within 15 min (urgent situation with no immediate vital risk but at risk of worsening)
- Priority 3** Level 3 triage treatment needed within 45 min (subacute but stable condition)
- Priority 4** Level 4 triage assessment needed within 90 min
- Priority 5** Level 5 triage assessment needed within 120 min

QUIT  SUBMIT

Right: An example of the Stroop effect. A similar test was used as an additional stressor to replicate pressure similar to that of working in an emergency room.

Left: Screenshots of the Emergency Case Review presented to the three different nurse groups for research purposes  
*Images courtesy of the Faculty of ICT, University of Malta*

Blue	Green	Brown	Pink
Yellow	White	Grey	Red
Black	Orange	Purple	Beige

aspect of 'on-the-job' performance. 'We cannot reject our conclusions based on these results until further research is conducted, but we must keep in mind that nurses are trained to perform under pressure,' Bugelli says.

One possible reason for this outcome is Yerkes-Dodson's Law. Essentially, working under pressure for a short period of time might make you more productive in the short term. 'When you are given vigilant tasks, you focus all your energy on these tasks and perform highly – but then again, after a certain time, depletion kicks in, and the expected results start diminishing,' Cassar adds. Essentially, it emphasises the importance of finding the right balance of stimulation or stress to achieve the best outcomes in different situations.

Beyond the quantitative approach of measuring the statistical outcomes of the nurses' performance, Bugelli looked into qualitative data by using open-ended questions after each case, where nurses were asked for the reason behind their judgements.

'We realised that people in the two groups – where they had time limitations and where they had an added distractor and time limitation – were more likely to elaborate on their judgements compared to the ones in the group without any distraction. Participants in these two groups were more elaborate and descriptive in their reasoning,' Cassar says. Adding to this, Bugelli points out how, 'We found a slightly bigger tendency for people to be reluctant in instances when there was no time pressure or distraction.' This could also be attributed to Yerkes-Dodson's Law.

The researchers' testing tool was well received, and participants in the study spoke highly of it. This positive feedback validates the tool for further research to understand noise and related performance better. Despite the small sample



**Luca Bugelli**  
**M.A. student**

size used in the study, Bugelli successfully managed to set up a simulation-based research project and possibly the first noise audit, according to Kahneman's guidelines, locally. The research has paved the way for future noise audits, while the web app itself has the potential to be used for training.

Nurses are trained to work under pressure, and therefore, it is likely that they perform better under pressure. However, nurses and medical professionals are highly susceptible to burnout due to the taxing nature of their work. It is imperative to treat medical professionals with dignity and respect. No matter how difficult a situation may look, a pinch of understanding and compassion can always help quiet the noise. **T**