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How distracting and how dangerous are roadside billboards

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Three Studies on sign observation/distraction

1. Observations and survey of drivers stopped at red light with view of digital billboard
2. Looking behavior of drivers as they drive towards a giant billboard and in the opposite direction
3. Crash analysis from a natural experiment in an urban freeway with and without billboards

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Study 3: Crashes and billboards on urban highway (Zaidel et al., 2010)

- Background: Israel's supreme court ruled that the signs on the urban freeway must be removed for one year while an evaluation takes place.
- Contentious location: Urban Freeway through Tel Aviv

Study 3: Method

- Design: Quasi experimental: Before rule (2006-2007) vs. after rule (2008), and with vs. without signs that were covered
- Dependent measures: Crashes and injuries
- Control variable: traffic volume
- Study sites: 8 Treatment sites and 6 control sites on the Tel Aviv Freeway

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Examples of Billboards

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Results: All Crashes before and after sign removal

Year	Total Crashes	
	Control sites	Treatment sites
2006	849	106
2007	857	95
2008	825	65

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Results: Injury Crashes before and after sign removal

Year	Injury/Fatal Crashes	
	Control sites	Treatment sites
2006	240	40
2007	262	55
2008	255	17

Average Crash reductions after adjusting for volume

- All crashes 0.60 (c.i. 0.39-0.92)
- Injury crashes 0.39 (c.i. 0.20-0.79)
- P.D. crashes 0.72 (c.i. 0.44-1.17)

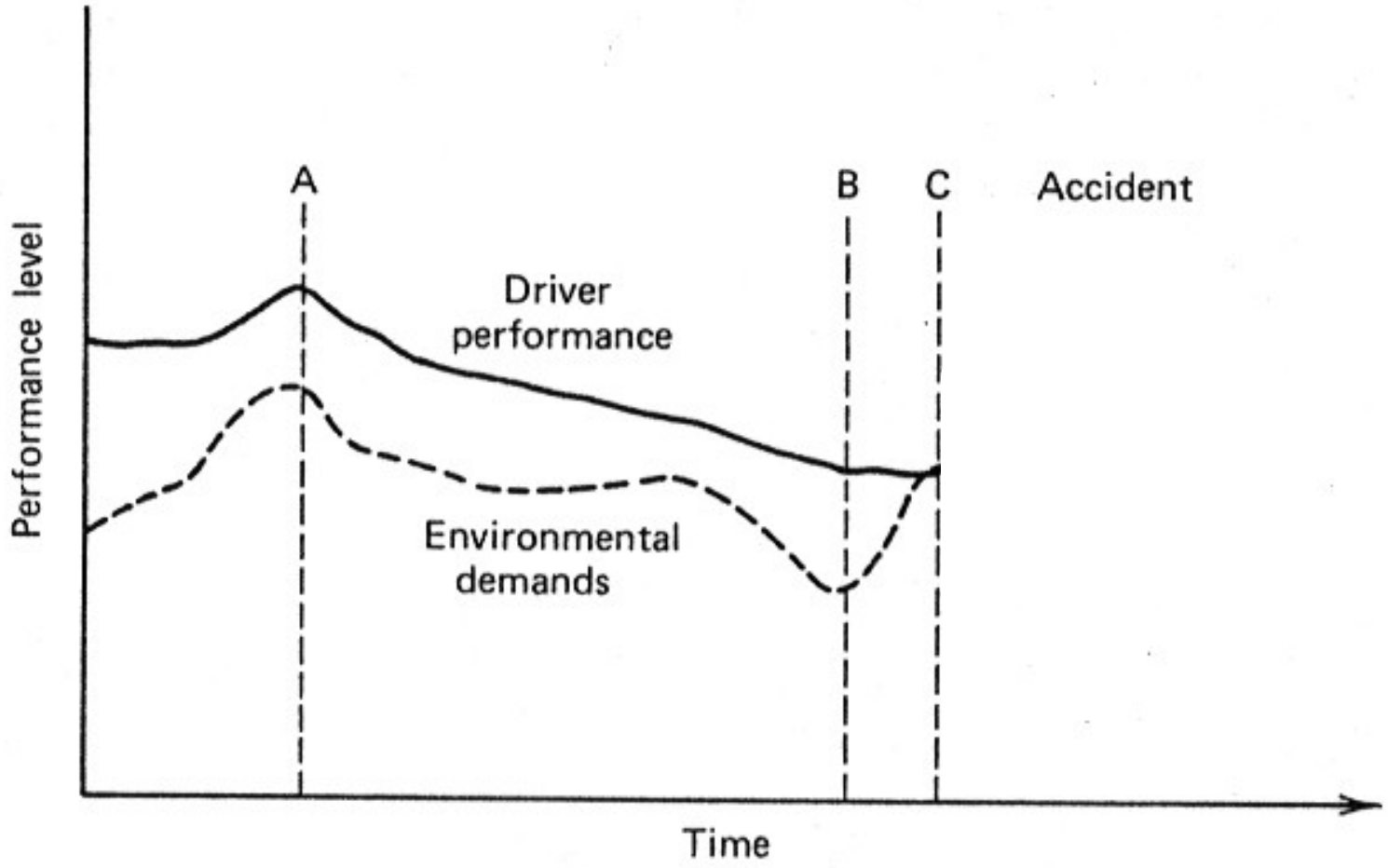
Conclusions

- Drivers have spare capacity – they seek stimulation, including off the road.
- Signs/billboards provide that stimulation.
- Some situations are safe (while stopped at intersections) other are not (while driving in high-speed dense traffic w multiple exits and lane changes).
- Crashes happen when there is a gap between driver expectation and reality.

So why don't we attend to the road all the time?

- For an experienced driver, most driving does not require full processing capacity
- Distraction is a problem only when the primary task (driving) is so demanding so that a secondary (distraction) task overloads the driver
- The Most dangerous situation is when the driver is "immersed" in the distracting task (e.g., driving while talking rather talking while driving) and the change in driving demands is unexpected (e.g., car ahead suddenly stops).

Crash as a function of 'circumstances' and 'lack of attention'/ human resource allocation (from Blumenthal, 1968)



Implications

- Minimize gaps between reality and expectations
- Prohibit distractions where demands are high but possibly unexpected
- When demands are expected to be low and **are** low , distractions from the driving task are probably not dangerous, and possibly beneficial (e.g. Burma Shave commercials)

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THANK YOU

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