

Prospective Memory in Anaesthesia: Results from a Pilot Simulator Study

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TuPASS
Center for Patient Safety
and Simulation

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

DIMS
Dansk Institut for Medicinsk Simulation

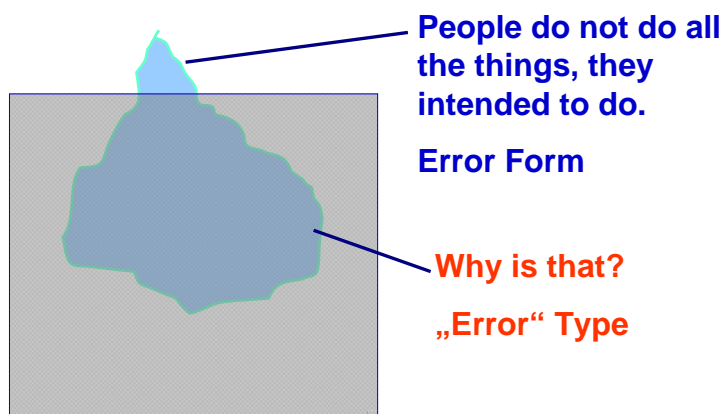
Background

- Too many humans die from critical incidents (Kohn et al., 1999)
- About 2/3 of these are connected to human error
- “Human error” labels a great variety of concepts
- Focusing on specific errors will help dealing with them

PM and Patient Safety

- MedMarx: In 14% of 6224 medication errors interruptions as contributing factor
(U.S.Pharmacopeia, 2000)
- Observational study in emergency room: 77% of tasks were interrupted
(Chisholm, Collison, Nelson & Cordell, 2000)

Focussing on one error form



Focus: Prospective Memory

Definition

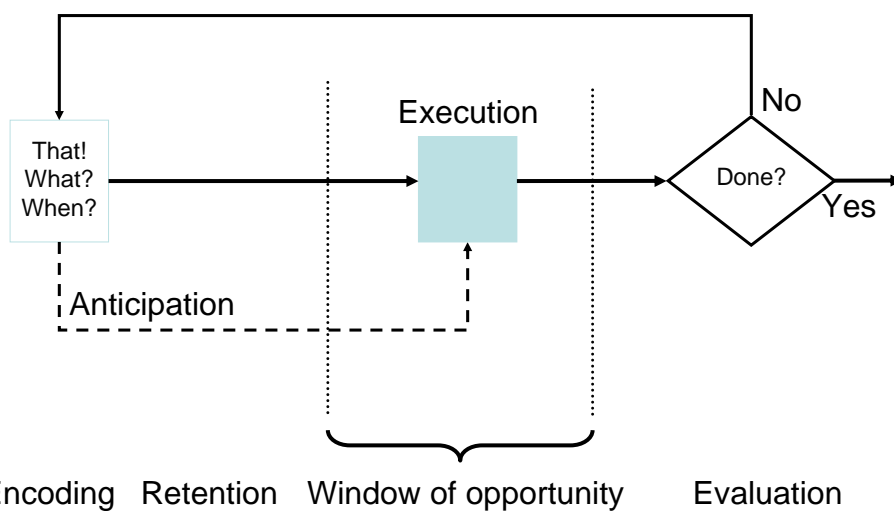
Prospective Memory identifies cognitive processes which enable humans to execute previously formed but delayed intentions without being explicitly reminded to do so.

Examples

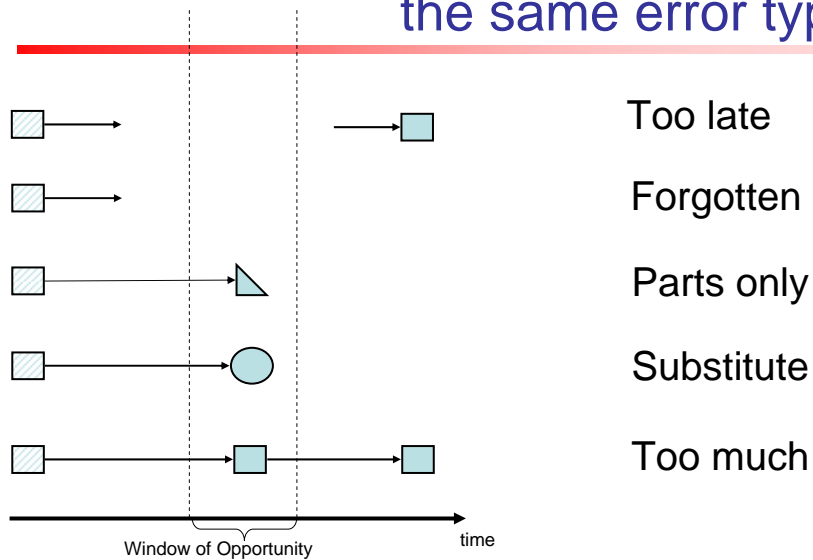
- reopening vaporizer after induction
- administering fetched Dantrolene
- passing on important information

PM Model

Adapted from Ellis (1996)



Different forms of the same error type



Influencing factors studied

- **Subjective importance of intention**
 - less PM failures for important intentions
(e.g. McDaniel & Einstein, 2001; Kliegel et al., 2001; Kvavilashvili & Ellis, 1996)
 - **Scenario motivated vs. 'real world' motivated**
 - less PM failures in the 'real world' than in the laboratory
(Ceci & Bronfenbrenner, 1985; Rendell & Craig, 2000)
 - **Simulator setting** (Dieckmann et al., 2003)
- Groupings on the right side of the list:
- important
 - unimportant
 - internal
 - external
 - educational

Method

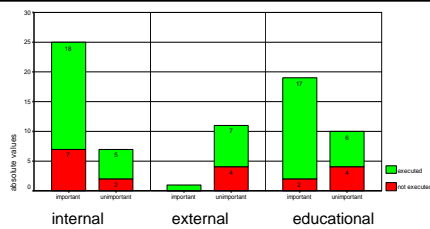
- Participants: Students in simulator course
 - Ten OR scenarios with up to five intentions
 - run four times
 - n=96 Intentions
 - 36 internal
 - 12 external
 - 48 educational
 - Post-hoc rating of subjective importance
 - Dependent variable: percent of execution/failures
 - χ^2 - Test
- } Team level

Results

Importance
 unimportant < important
 n.s. (χ^2)

Type
 external < internal < educational
 n.s. (χ^2)

Interaction
 failure: p=.025 (n=19; df=2; $\chi^2= 7.41$)
 execution: p=.002 (n=54; df=2; $\chi^2=12.50$)



64% of unimportant
80% of Important

72 % of internal
67 % of external
79 % of educational

Summary

- Subjective importance seems to be relevant for the execution of intentions.
- Educational intentions seem to be most relevant in a student simulator course.
- External intentions are executed despite of a low subjective importance.

Main Critique

- Team level analysis
- Confundation of intention type and intention salience

Conclusion

- Making intentions subjectively important might help to execute them.
- Consider the power of instruction within the simulator setting (external intentions).
- Use your simulator to study human error.

Contact

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These slides are based on:

Dieckmann, P., Reddersen, S., Wehner, T., & Rall, M. (2006). Prospective memory failures as an unexplored threat to patient safety: results from a pilot study using patient simulators to investigate the missed execution of intentions. *Ergonomics*, 49(5-6), 526-543.