Premortem: Evaluating two structured analytic techniques for group brainstorming

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INTRODUCTION

Teams from software to crisis response must generate plans and make predictions about their outcomes. Few controlled, randomized experiments have been conducted to evaluate plan evaluation techniques and more are needed (Veinott, Klein, & Wiggins, 2010).

Past research has shown that people are overconfident in plan completion times and predictions (Buehler, Griffin, and Ross, 1994).

Few studies have systematically compared the effect of analytic perspectives on plan confidence or individual vs. group brain storming on plan confidence.

Experiment 1: Examines the role of two perspective frames on plan evaluation change.
- *Premortem:* (involving prospective hindsight) Evaluate a plan under the assumption that it is the future, and the plan failed catastrophically (Klein, 2007; Mitchell et al, 1989).
- *Promortem:* Evaluate the plan assuming it is the future and the plan was a success (Parks et al., 2011).

H1: Those doing a premortem will have a greater reduction in confidence compared to the promortem or control condition.

Experiment 2: Focuses only on the premortem and compares individuals conducting it alone to groups conducting one.
- Meta-analysis result group brainstorming generate fewer unique ideas than individual brainstorming (c.f., Mullen et al., 1991)
- Group premortem more effective than pro/con list or critiquing (Veinott et al., 2010)

H2: Groups using the premortem will reduce their confidence more than individuals.

METHODS

Participants: Exp 1: 53 students (37.7% male) **Exp 2:** 43 students (51.2% male)
**Cybersecurity Task:** Imagine you received the following email from your University IT. "Yesterday there was a potential security breach at this University, you have five days to change your email password, or else you will lose access to the University network system."
IV: Plan evaluation method: Control (Filler) vs. Premortem **vs.** Promortem,
DV: Ratings How confident are you that the plan will succeed? Confidence (Scale 0-100)
How well do you understand the plan? Understanding (Scale 0-100).
Procedure (Fig 1). Exp 1: Review plan, complete initial ratings (conf, understanding), complete one experimental condition, 2nd round ratings, generate solutions. **Exp 2:** Two premortem conditions, one with group collaboration component at Step 3 and Step 4, one condition with the group collaboration.

Figure 1. Procedure Exp 1 and 2
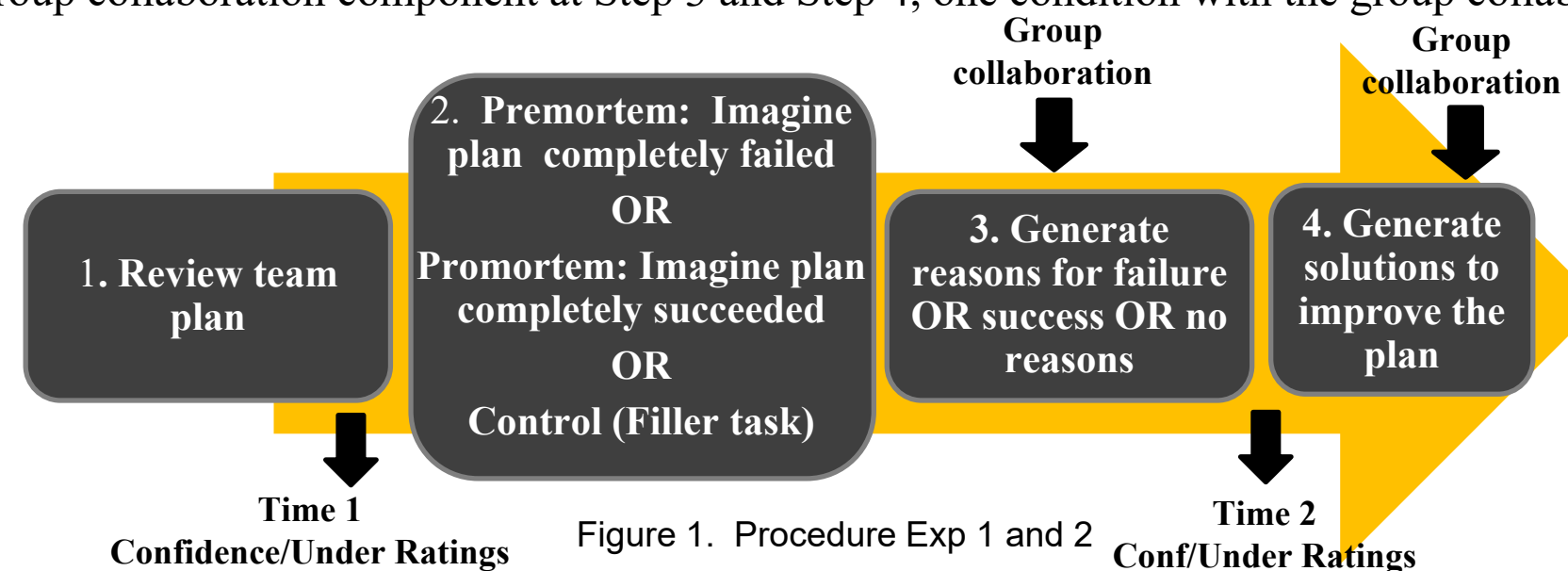
RESULTS

Exp 1 H1: Does the frame perspective affect confidence? (Fig 2) Understanding?
Yes. Those in the premortem group reduced their confidence more than those in the promortem or control condition, F(2,51)=4.02, p=.024, d=.81. Understanding had a similar pattern and was marginally significant, F(2,51)=2.8, p=.077. H1 was supported.

Exp 2 H2: Research Question: Does conducting an individual premortem (no group collaboration) vs. a group premortem affect plan evaluation confidence? (Fig 3.) Understanding?
There was no statistically significant difference of an individual premortem vs. group premortem on plan confidence, F(1, 42)=0.85, p=.772, or understanding, F(1, 42)=2.46, p=.124. H2 was not supported. Indication is that group processes did not hurt the evaluation process.
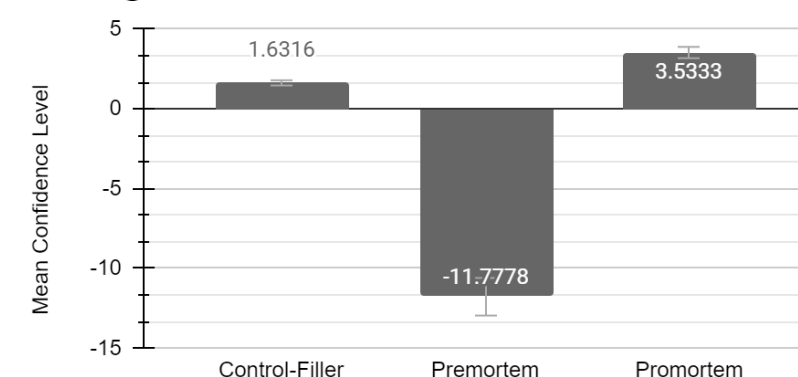

Fig 2. Confidence Change by Plan Evaluation Methods Control (Filler) vs. Premortem vs. Promortem.
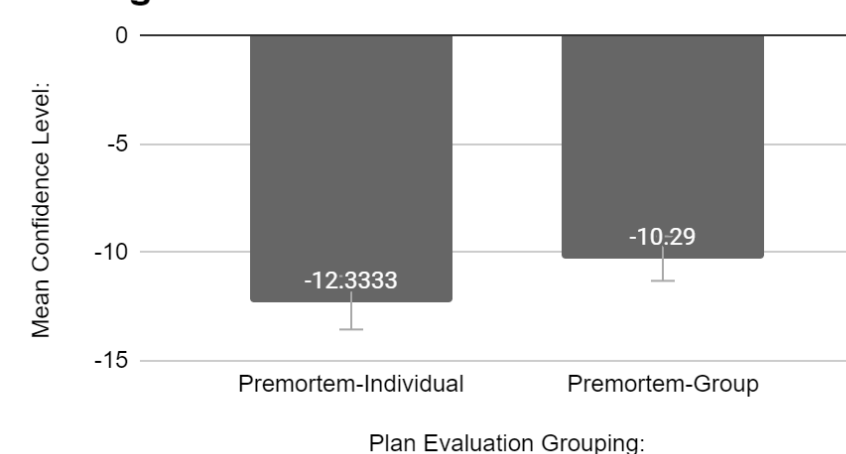

Fig 3. Confidence Change Individual vs. Group Premortem

DISCUSSION

First step in a series of studies. Expands previous empirical planning research (Gallop, Willy, & Bischoff, 2016; Veinott, Klein, & Wiggins, 2010) by comparing the promortem to the premortem and replicating with a new cybersecurity scenario with users of that system (Peabody, 2017).
- Exp 1 showed that those in the *promortem* group (prospective forward reasoning) were more confident than those in the *premortem group* (prospective backward reasoning). Only the *premortem* differed from the control group.
- Exp 2 showed no statistical differences between premortem groups and individuals for confidence or understanding indicating no deficit (Mullen et al. 1993).
- Implication: Small procedural difference led to better idea generation for planning and decision-making.
- Future studies are examining the role of this type of structured analytic technique for outcomes of plan evaluations (e.g., reasons, solutions, forecasts).

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