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When does presenting incremental risks improve medical decision making compared to presenting separate total risks?

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I Introduction

- When judging medications, it is important to know how many more benefits and risks the treatment causes compared to a placebo
- To improve the understanding of these incremental benefits and risks of treatments, the **incremental risk format** (RF) has been introduced[1,2]
- The incremental RF **highlights the incremental benefits and risks**
- While risks are subjectively perceived as less likely and worrisome in the incremental RF compared to the common total RF, **evidence on knowledge is mixed**[1-3]
- While the incremental RF is less common and intuitive, it makes the computation of the incremental benefits and risks unnecessary
- Therefore, this study investigates the incremental RF by focusing on **learning** and **features of the judgment ecology**

Hypotheses

- H1: **no general difference** in knowledge between risk formats
- H2: incremental RF is superior to total RF **if people have the chance to get used to it**
- H3: incremental RF is superior to total RF **in more complex judgments**

M Method

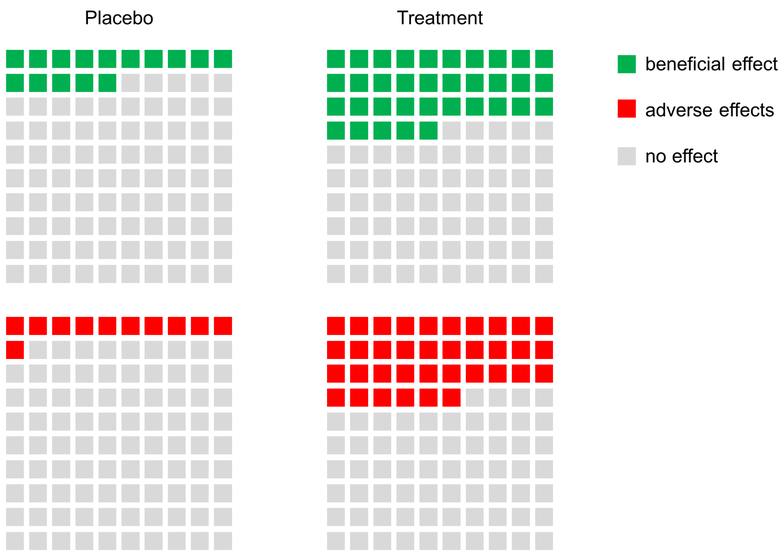
Study 1 (*N* = 99)

- between-subjects experiment
- comparison of 3 medications
- IV:
  - risk format (total vs. incremental)
- DVs:
  - verbatim and gist knowledge
  - recall
  - subjective attractiveness and accessibility

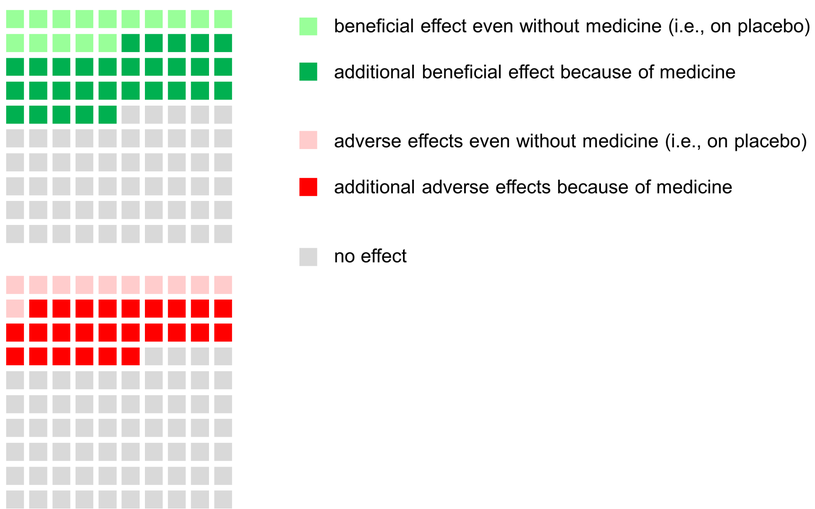
Study 2 (*N* = 222)

- between-subjects experiment
- 8 comparisons of medications
- IVs:
  - risk format (total vs. incremental)
  - complexity (3 vs. 6 medications)
  - feedback (no vs. yes)
- DVs:
  - verbatim and gist knowledge
  - subjective attractiveness and accessibility (after first and last trial)

Total Risk Format



Incremental Risk Format



R Results

Study 1

- total RF led to higher knowledge ($F(1,65) = 18.69$, $p < .001$)
- total RF was rated as more attractive and more accessible ($F(1,95)=4.79$, $p = .03$ and $F(1,95)=20.64$, $p < .001$, respectively)

Study 2

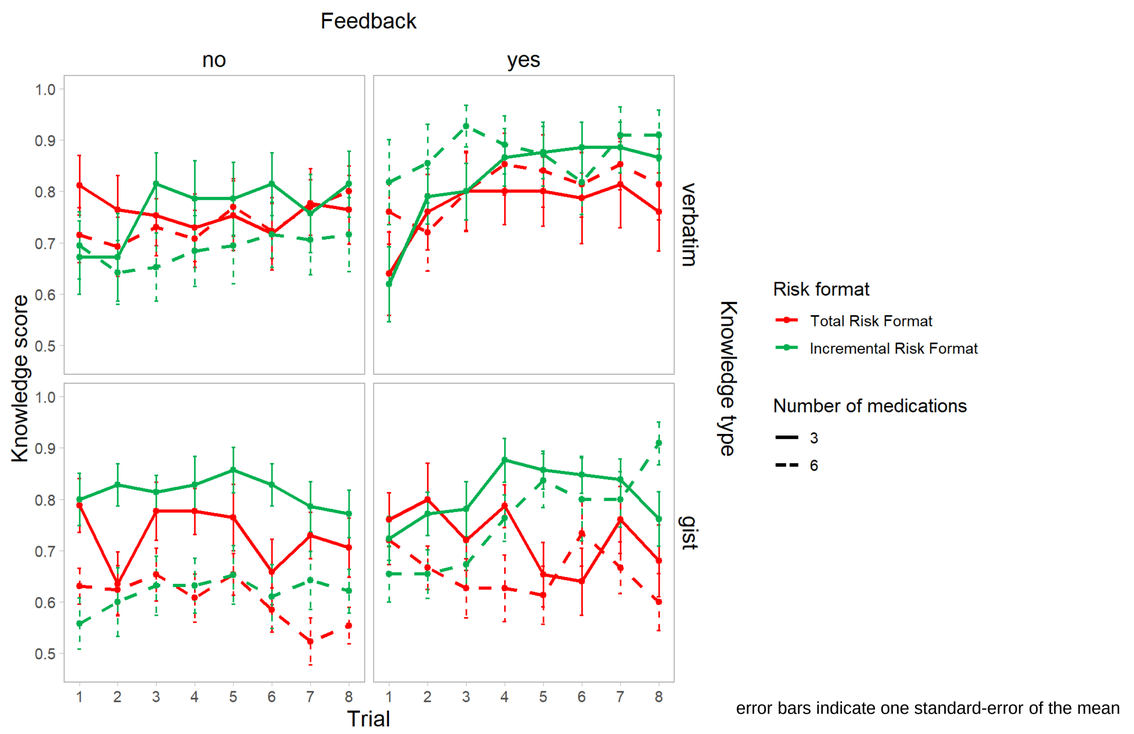
DV: Knowledge

- **Risk format (H1)**: no main effect of RF ($F(1,212) = 0.34$, $p = .56$)
- **Type of knowledge**: the incremental RF led to better gist knowledge, but not to better verbatim knowledge ($F(1,214) = 17.05$, $p < .001$)
- **Learning (H2)**: if people had the chance to get used to the format, the incremental RF led to better knowledge ($F(1,214) = 7.76$, $p = .01$)
- **complexity (H3)** and **feedback** did not moderate the effect of RF ($F(1,214) = 0.20$, $p = .66$ and $F(1,214) = 2.30$, $p = .13$)

DV: Attractiveness and Accessibility

- no main effect of RF ($F(1,212) = 0.89$, $p = .35$; $F(1,212) = 0.60$, $p = .44$)
- **moderation of time:** incremental RF was rated more favorably after getting used to it ($F(1,214) = 9.94$, $p < .01$; $F(1,214) = 11.65$, $p < .001$)

Knowledge scores (Study 2)



error bars indicate one standard-error of the mean

C Conclusion

- Study supports recommendation of incremental risk format only partially
- Incremental risk format is superior only if a) gist knowledge is relevant and/or b) people have the chance to get used to it
- Study encourages future research to consider learning and conditions of the judgment ecology when investigating risk communication

References

[1] Zikmund-Fisher, B., Fagerlin, A., Roberts, T., Derry, H., & Ubel, P. (2008). Alternate Methods of Framing Information About Medication Side Effects: Incremental Risk Versus Total Risk of Occurrence. *Journal of Health Communication*, *13*, 107–124. https://doi.org/10.1080/10810730701854011.

[2] Zikmund-Fisher, B. J., Ubel, P. A., Smith, D. M., Derry, H. A., McClure, J. B., Stark, A., Pitsch, R. K., & Fagerlin, A. (2008). Communicating side effect risks in a tamoxifen prophylaxis decision aid: The debiasing influence of pictographs. *Patient Education and Counseling, 73*(2), 209–214. https://doi.org/10.1016/j.pec.2008.05.010

[3] Price, M., Cameron, R., & Butow, P. (2007). Communicating risk information: The influence of graphical display format on quantitative information perception – Accuracy, comprehension and preferences. *Patient Education and Counseling*, *69*, 121–128. https://doi.org/10.1016/j.pec.2007.08.006

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