

Impact of Generative AI Driven Impression Generation on Radiologist Workload and Burnout: A Clinical Application of Jevons Paradox

James Graham MD¹, Janusz Kikut MD¹

¹University of Vermont Medical Center, Department of Radiology • Burlington, VT

Background

Does AI efficiency reduce clinician burden?

Generative AI tools for impression drafting are rapidly entering radiology workflows. Nuance PowerScribe Smart Impression auto-drafts report impressions, promising time savings and reduced cognitive load.

Jevons Paradox – Efficiency gains from a new technology increase overall resource consumption rather than reducing it, because demand expands to fill the freed capacity.

This study tests whether efficiency gains from AI-assisted impression drafting translate to reduced radiologist workload or are absorbed by increased clinical intensity.

Methods

Survey-based study at UVMHC before and after Smart Impression deployment across the network.

Workload measured via Likert-scale items. Burnout assessed with a validated self-definition instrument. High-risk burnout defined as "Definitely burning out" to "Completely burnt out." Comparisons by Welch's t-test.

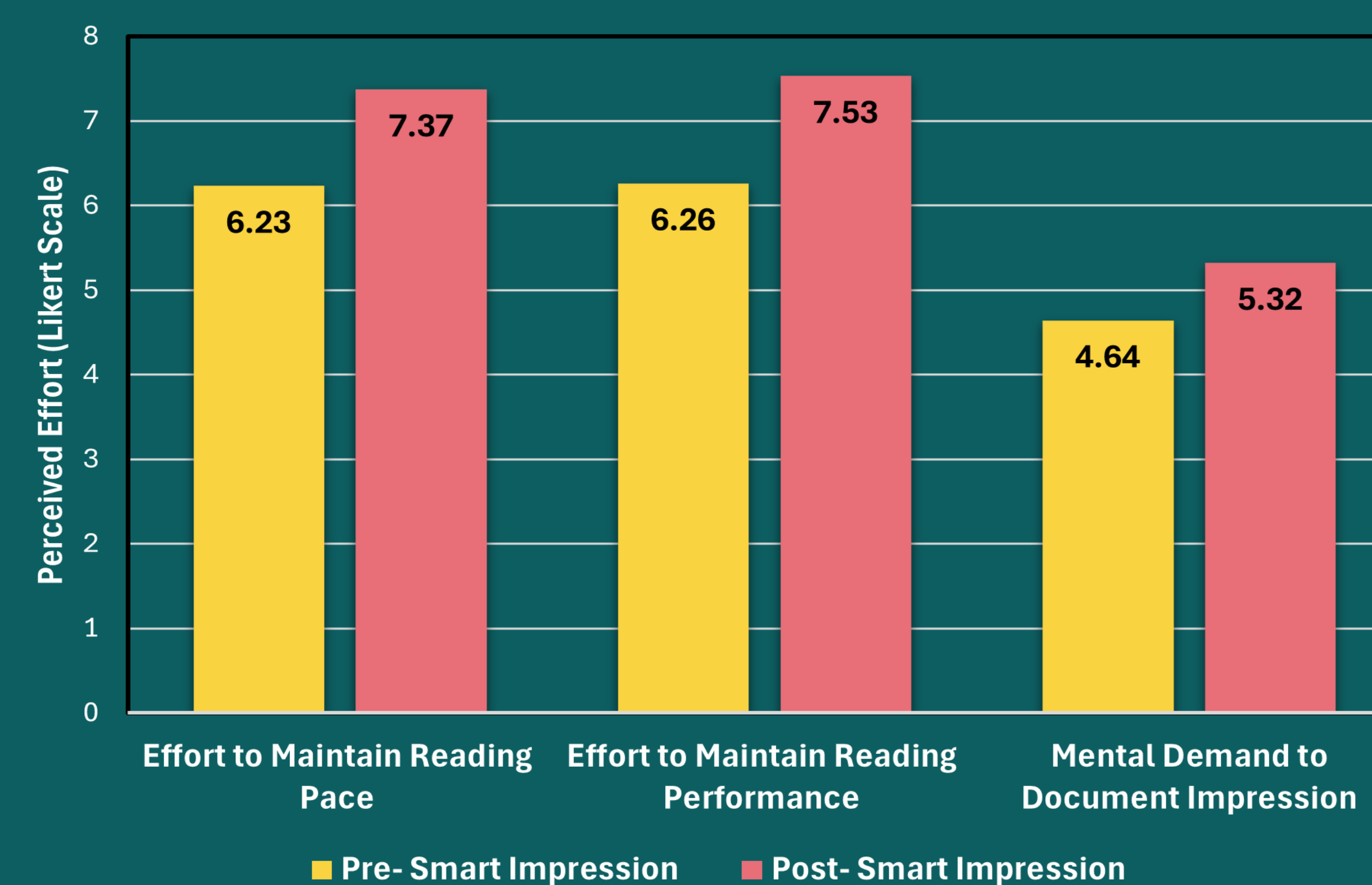
Results

Increased effort for **reading pace** and **reading performance**

Unchanged mental demand for impression

| Metric | Pre (mean ± SD) | Post (mean ± SD) | p-value |
|--|-----------------|----------------------|---------------|
| Effort to Maintain Reading Pace | 6.23 ± 1.70 | 7.37 ± 1.71 ↑ | 0.024* |
| Effort to Maintain Reading Performance | 6.26 ± 1.63 | 7.53 ± 1.54 ↑ | 0.007* |
| Mental Demand to Document Impression | 4.64 ± 2.36 | 5.32 ± 2.11 | 0.284 (NS) |

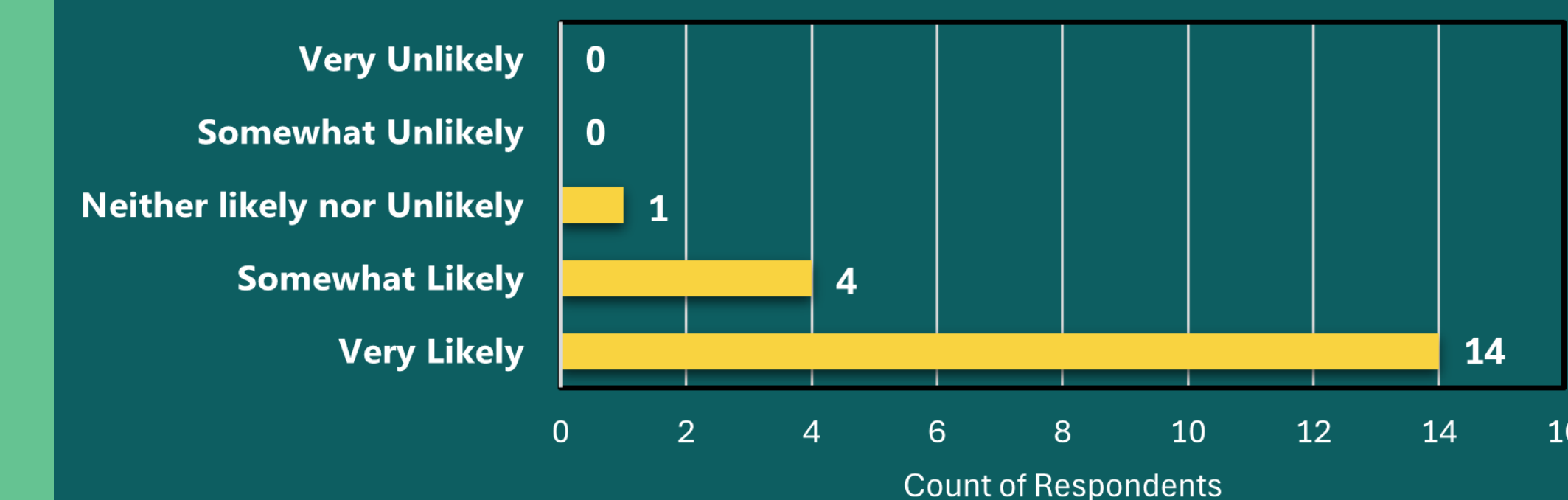
Pre and Post Smart Impression Workload Metrics



Results

Near-universal tool uptake, high perceived value

How likely would you be to recommend the Smart Impression tool to another radiologist?



No improvement in burnout risk

45.5%

High-risk burnout Pre-implementation

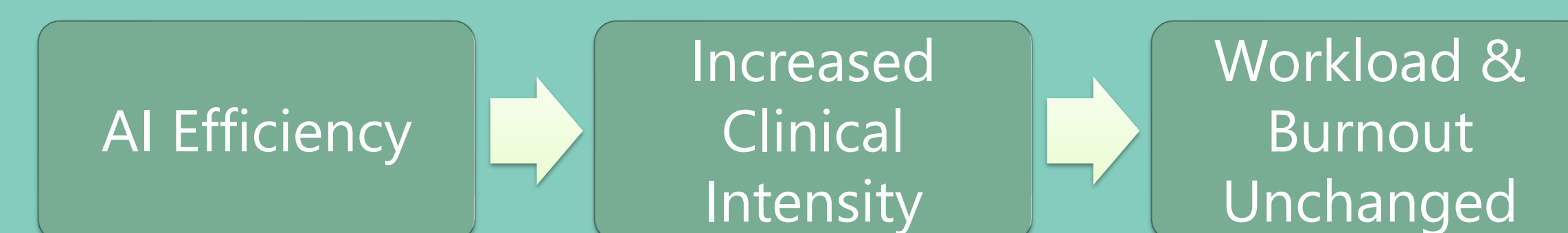
46.2%

High-risk burnout Post-implementation

p = 0.967 — no statistically significant change

Conclusion

Clinical manifestation of Jevons Paradox



AI tools risk amplifying throughput demands without careful implementation. Future work should examine whether workflow protections can decouple AI efficiency from reading intensity