How implementable is that evidence-based practice?

User-centered design of complex psychosocial interventions

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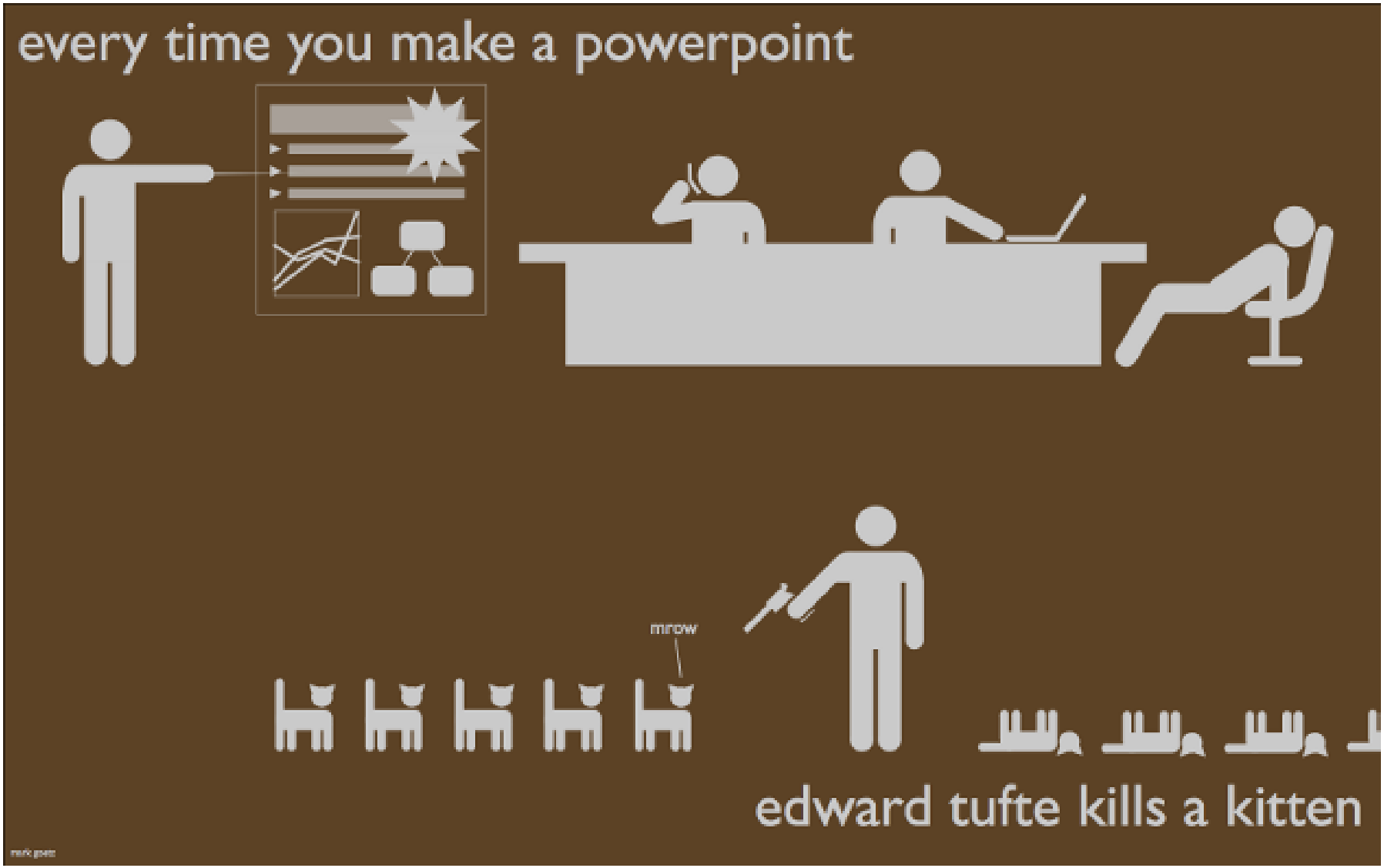
@Aaron_Lyon

Apologies…


every time you make a powerpoint
mrow
edward tufte kills a kitten

There is no such thing as “no design”

“The alternative to good design is bad design, not no design at all. Everyone makes design decisions all the time without realizing it.”

Douglas Martin (1990)

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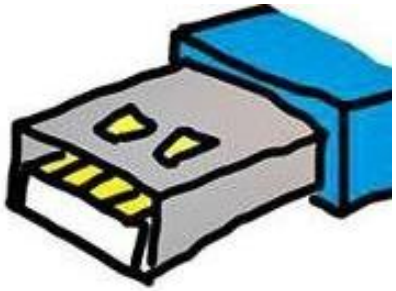
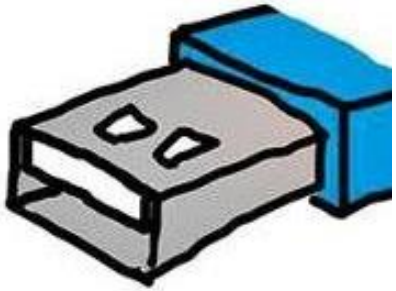
Problematic Design is EVERYWHERE

Up position



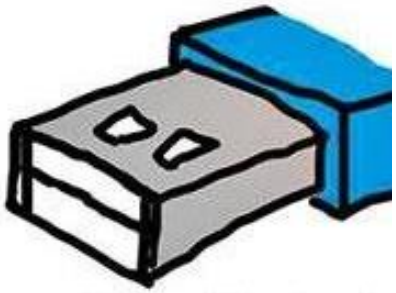
It is a well known fact that you must spin a USB three times before it will fit. From this, we can gather that a USB has three states.

Down position



Until the USB is observed it will stay in the superposition. Therefore it will not fit until observed - except for in cases of USB tunelling.

Superposition



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Design Problems Reduce Usability

Usability: the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction
(International Standards Organization, 1998)

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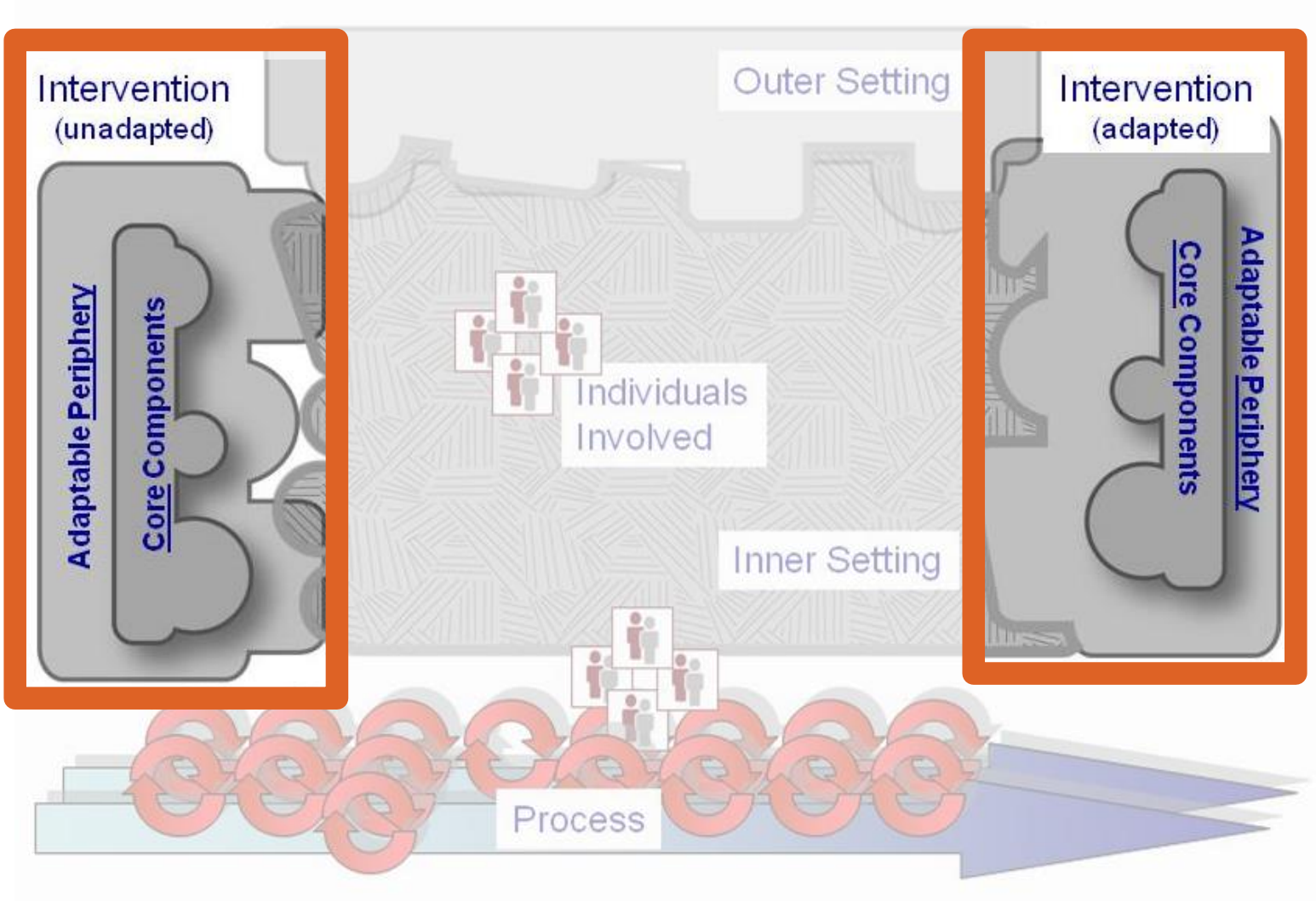
System Level: *Intervention*



Damschroder et al. (2009)

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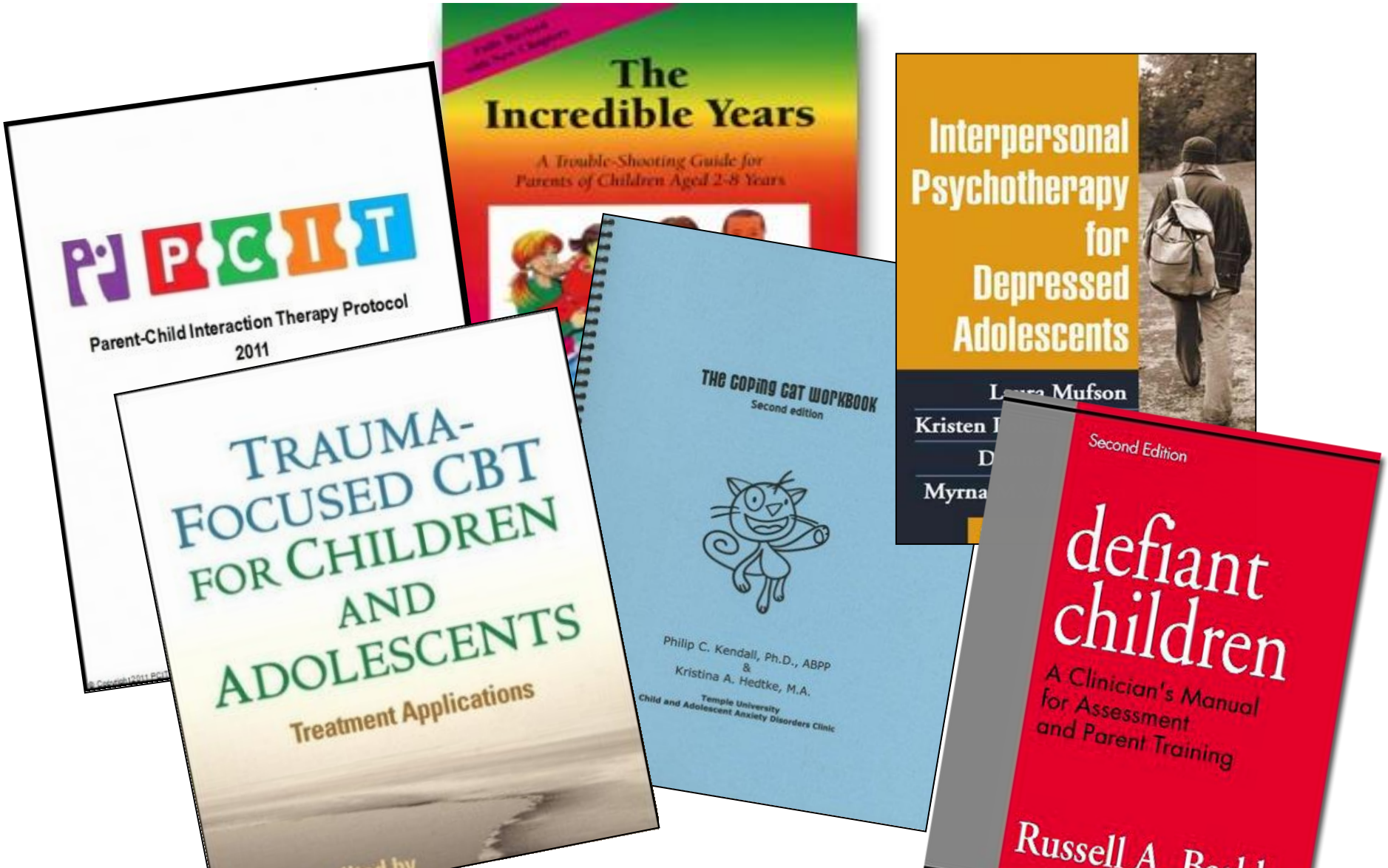
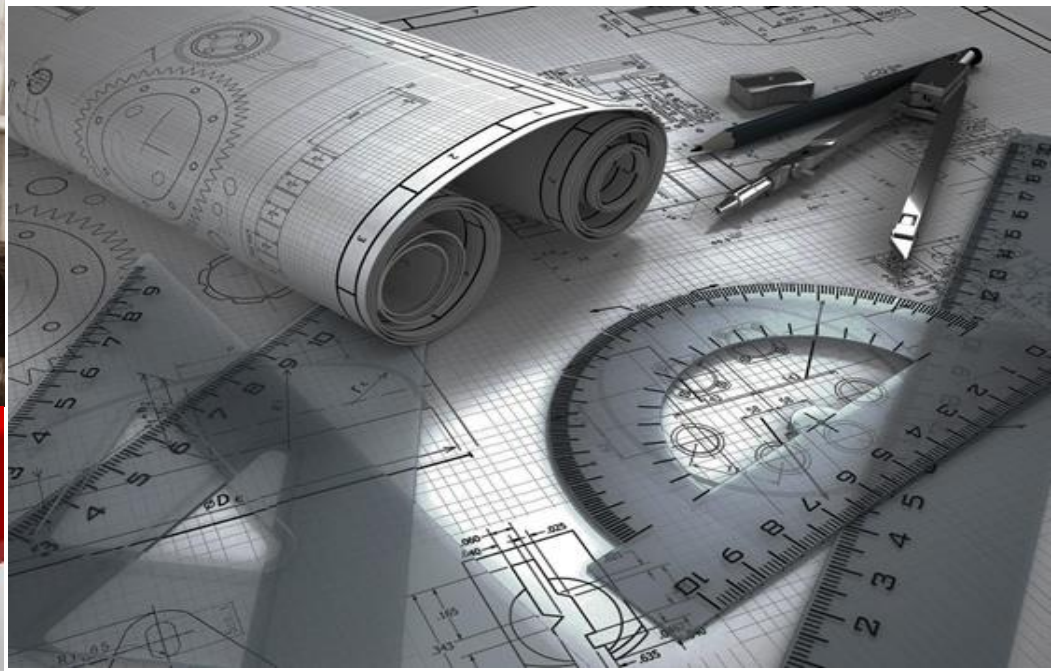
EBPIs Dominate the D&I Landscape in MH



MH EBPIs are Well Engineered



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MH EBPIs are TERRIBLY Designed

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Intervention-Level Determinants are Underexplored in Implementation Science

- SIRC Instrument Review Project (IRP) (Lewis et al., 2015)
  - Only **19** instruments addressed intervention characteristics
    - *Inner setting:* **90** instruments
    - *Individual:* **98** instruments
  - **0** instruments addressed **DESIGN QUALITY & PACKAGING**

SIRC
SOCIETY FOR IMPLEMENTATION RESEARCH COLLABORATION

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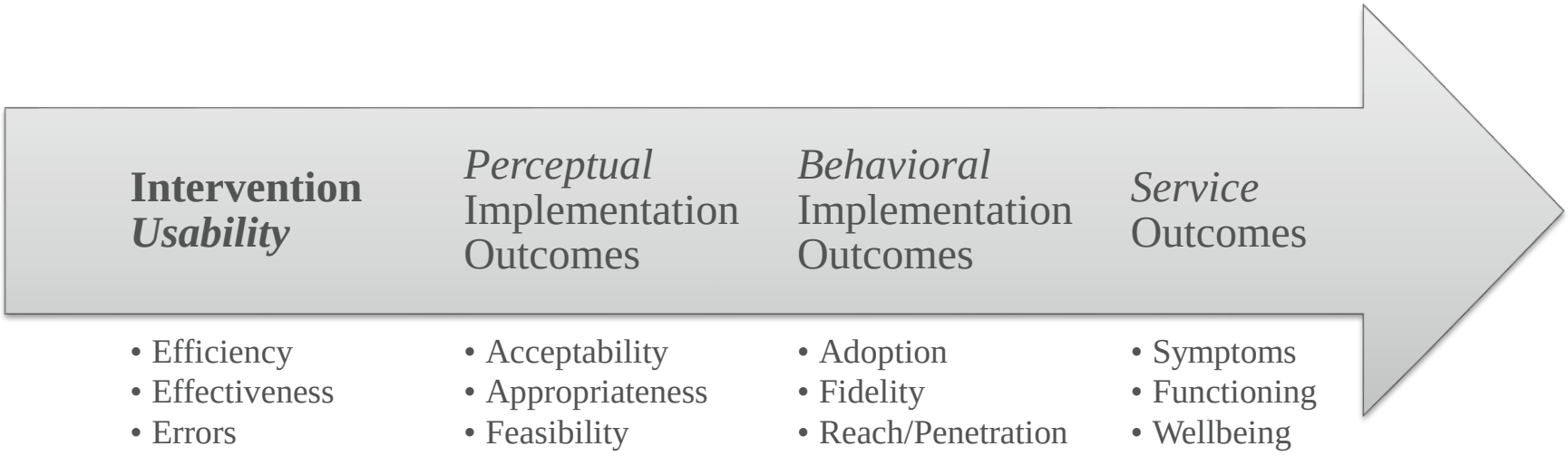
Intervention Usability is a Key "Upstream" Determinant of Implementation Outcomes



Lyon & Bruns (in press)

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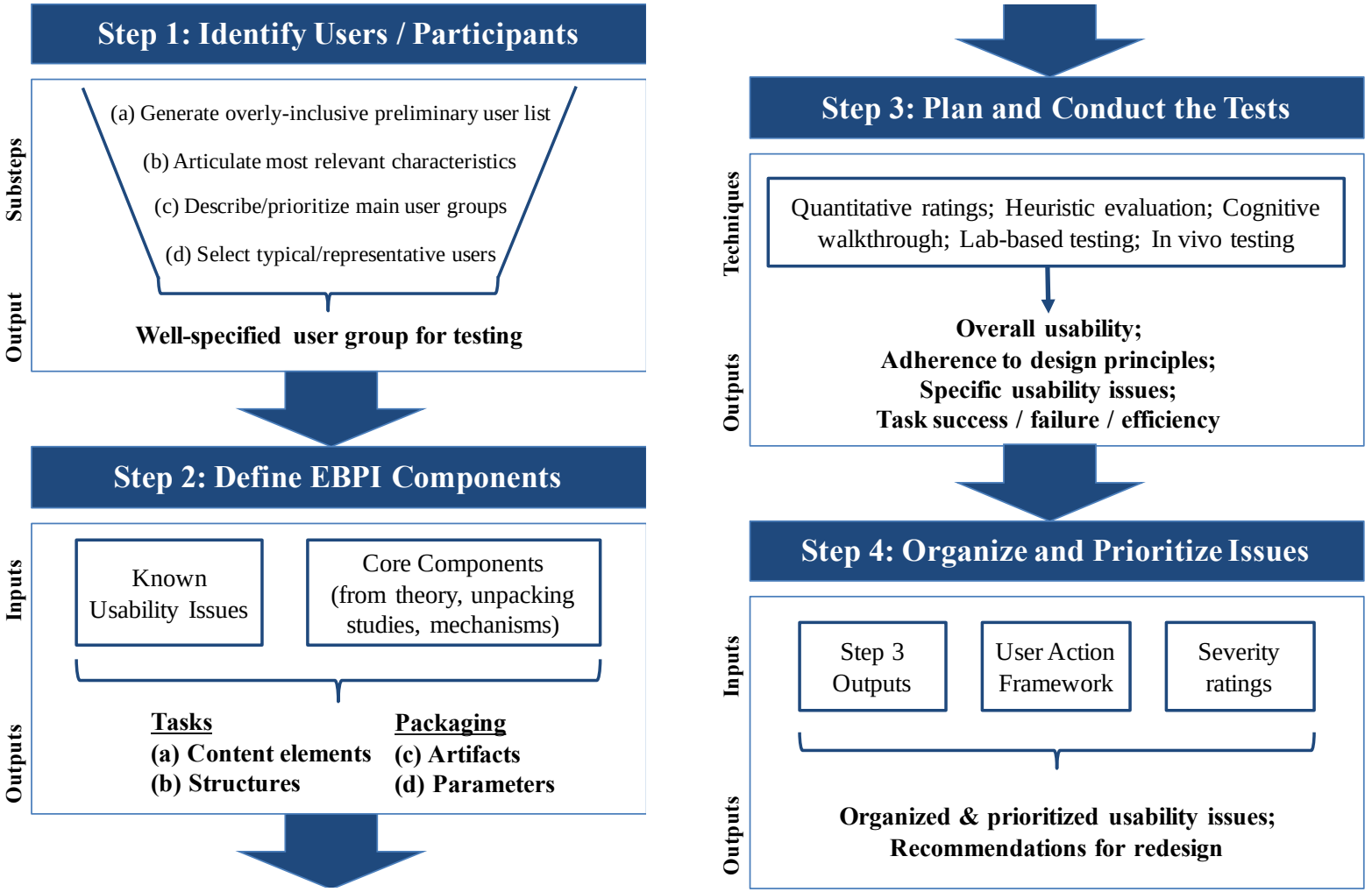
Usability Evaluation for Evidence-Based Psychosocial Interventions (USE-EBPI)



Lyon, Koerner, & Chung (under review)

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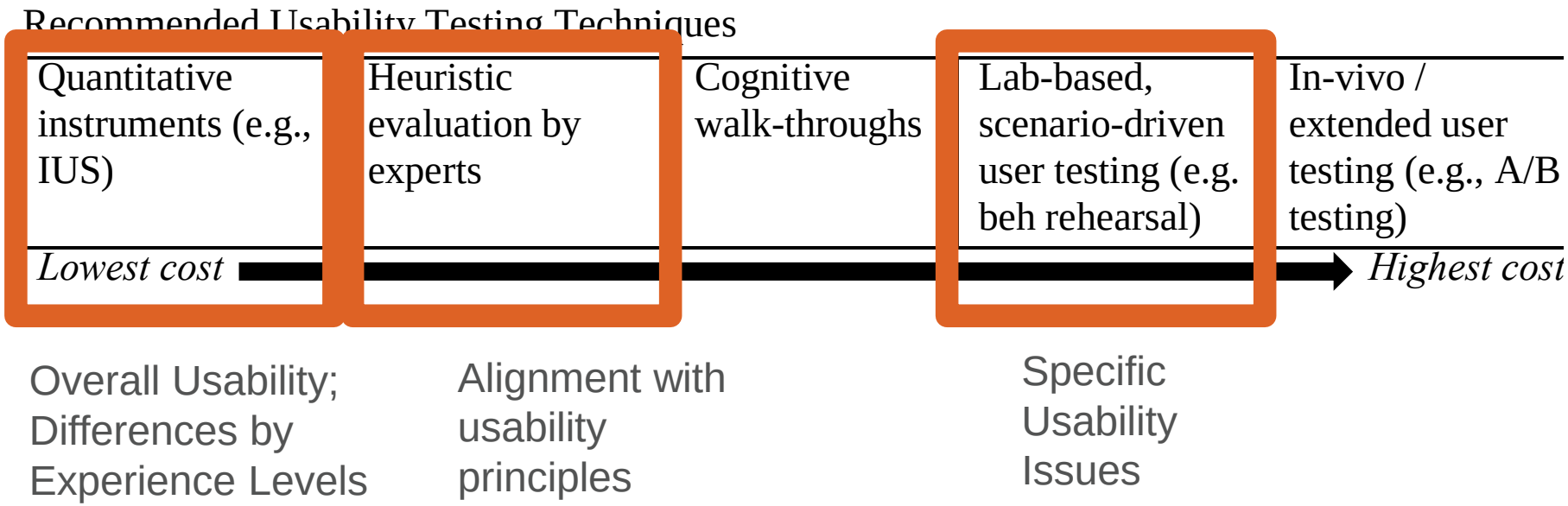
Application of USE-EBPI to an Exposure Protocol: Phase 3 (Plan/Conduct)



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Application of USE-EBPI to an Exposure Protocol: Phase 3 (Plan/Conduct)

- **Heuristic Evaluation Rubric for EBPIs (HERE)**

Heuristic Evaluation Rubric for EBPIs (HERE)

Criteria: **Scale (1-10; 1=not at all; 10=extremely)**

1. **Learnability** 1 2 3 4 5 6 7 8 9 10

   The EBPI provides users with opportunities to rapidly build understanding of, or facility in, its use.

2. **Efficiency** 1 2 3 4 5 6 7 8 9 10

   The EBPI can be applied by users to resolve identified problems with minimal time, effort, and cost.

3. **Memorability** 1 2 3 4 5 6 7 8 9 10

   Users of the EBPI can remember and successfully apply important elements of the EBPI protocol without many added supports.

4. **Error reduction** 1 2 3 4 5 6 7 8 9 10

   The EBPI explicitly prevents or allows rapid recovery from errors or misapplications of content.

5. **Low cognitive load** 1 2 3 4 5 6 7 8 9 10

   The EBPI task structure is sufficiently simple so that amount of thinking required to complete a task minimized.

6. **Exploit natural constraints** 1 2 3 4 5 6 7 8 9 10

   The EBPI incorporates or explicitly addresses the static properties of the intended destination context, which may affect the ways it can be used.

7. **Overall assessment** 1 2 3 4 5 6 7 8 9 10

Notes / explanation of ratings:

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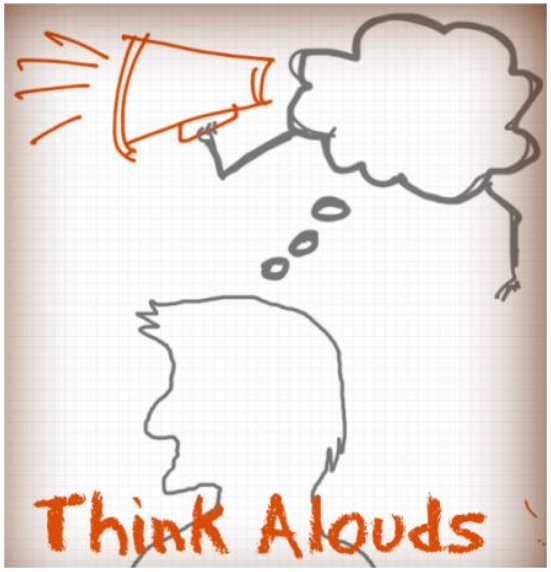
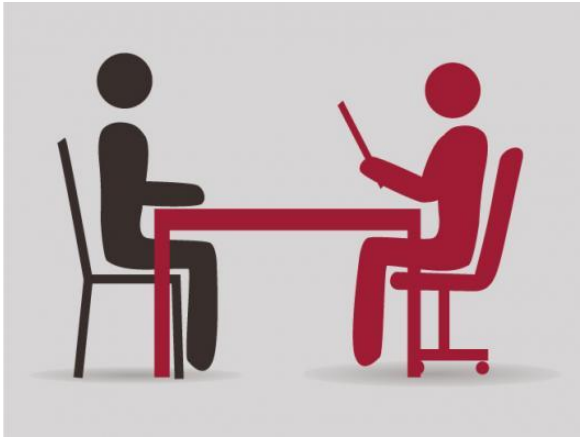
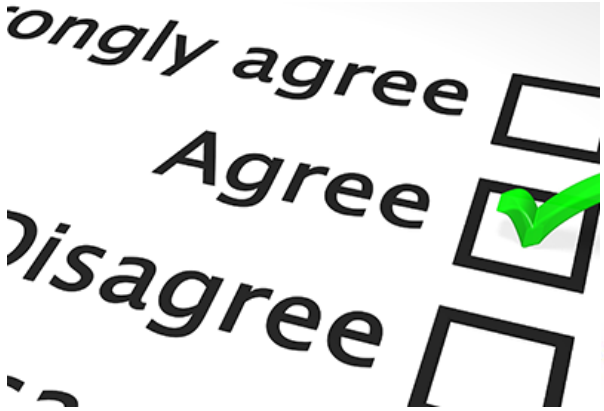
Application of USE-EBPI to an Exposure Protocol: Phase 3 (Plan/Conduct)

"Lab-based" testing (*n* = 10)







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Application of USE-EBPI to an Exposure Protocol: Phase 3 (Plan/Conduct)

- IUS range (scale: 0-100): 65-85
  - mean = 80.5 (*SD* = 9.56)

Group	IUS score
Novice (n = 3)	77.5 (*SD* = 10.90)
Intermediate (n=4)	77.5 (*SD* = 8.66)
Advanced (n = 3)	87.5 (*SD* = 8.66)

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Table 6. HERE Evaluation Ratings

Item	*Mean*	SD
Learnability *The EBPI provides users with opportunities to rapidly build understanding of, or facility in, its use.*	7.33	1.155
Efficiency *The EBPI can be applied by users to resolve identified problems with minimal time, effort, and cost.*	8.33	0.577
Memorability *Users of the EBPI can remember and successfully apply important elements of the EBPI protocol without many added supports.*	6.33	0.577
Error Reduction *The EBPI explicitly prevents or allows rapid recovery from errors or misapplications of content.*	7.67	0.577
Low Cognition Load *The EBPI task structure is sufficiently simple so that amount of thinking required to complete a task minimized.*	6.33	0.577
Exploit Natural Constraints *The EBPI incorporates or explicitly addresses the static properties of the intended destination context, which may affect the ways it can be used.*	5.00	3.606
Overall Assessment	7.33	0.577

Application of USE-EBPI to an Exposure Protocol: Phase 3 (Plan/Conduct)

- Task completion of exposure behavioral rehearsal. **FAILURE RATES**…
  - 2 (of 3) *novices* (66%)
  - 1 (of 4) *intermediates* (25%)
  - 0 (of 3) *experts* (0%)

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Table 7. Categorization and Rating of Usability Problems

Average Rating / User Type	Usability Problem	Step of UAF Impacted P | T | A | F
3.0	Contraindicated behaviors are ambiguous	X X
3.0	Failure to block contraindicated behaviors	X
2.5	Signposting	X X X X
2.5	Unclear Processing detail	X X
2.5	Lack of feedback on accuracy of hierarchy level	X X
2.0	Insufficient support of exposure planning	X X
2.0	Unclear purpose/rationale	X X
2.0	Omission of key content	X X
1.5	Failure to highlight therapist barriers	X
1.5	Insufficient feedback for success	X
1.5	Lack of troubleshooting for family/system issues	X X X
1.0	Habituation is unclear	X X X
1.0	Developmental level is unclear	X

Legend

P – Planning

T – Translation

A – Actions

F – Feedback

- novice

- intermediate

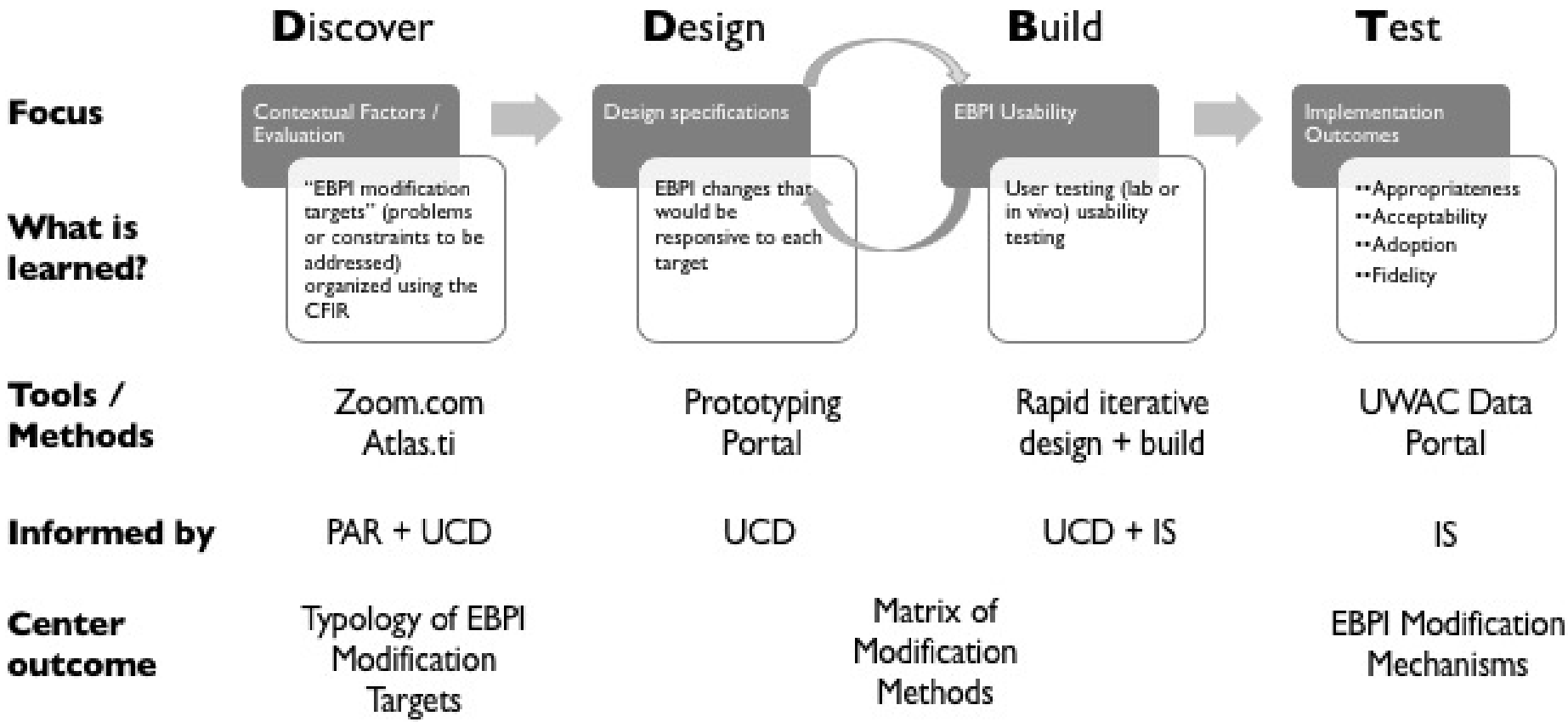
- expert

Filled circle=user experience issue

Lyon, Koerner, & Chung (under review)

Discover, Design, Build, & Test (DDBT) Framework

(P50MH115837; *Overall PI: Arean; Methods Core PI: Lyon*)



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Questions and Discussion

Sometimes

beats

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