The Learning Environment Assessment Framework (LEAF) Tool: Assessing Psychological Safety in a Group Learning Setting

Cristina E. Welch, MD[1], Melissa Carbajal, MD[1], Shelley Kumar, MS, MSc[2], Satid Thammasitboon, MD, MHPE[2,3]

[1]Section of Neonatology, [2]Center for Research, Innovation and Scholarship in Medical Education, , [3]Section of Critical Care, Department of Pediatrics, Baylor College of Medicine, Texas Children's Hospital, Houston, TX

Background

- Medical trainees often cite the learning environment of Morning Report (MR) as challenging
- Psychological Safety (PS) is felt to contribute to resident perceptions of clinical learning experiences
- PS and its impact on individual and team learning has been studied extensively in the business literature, but not well studied in group learning environments

Objective

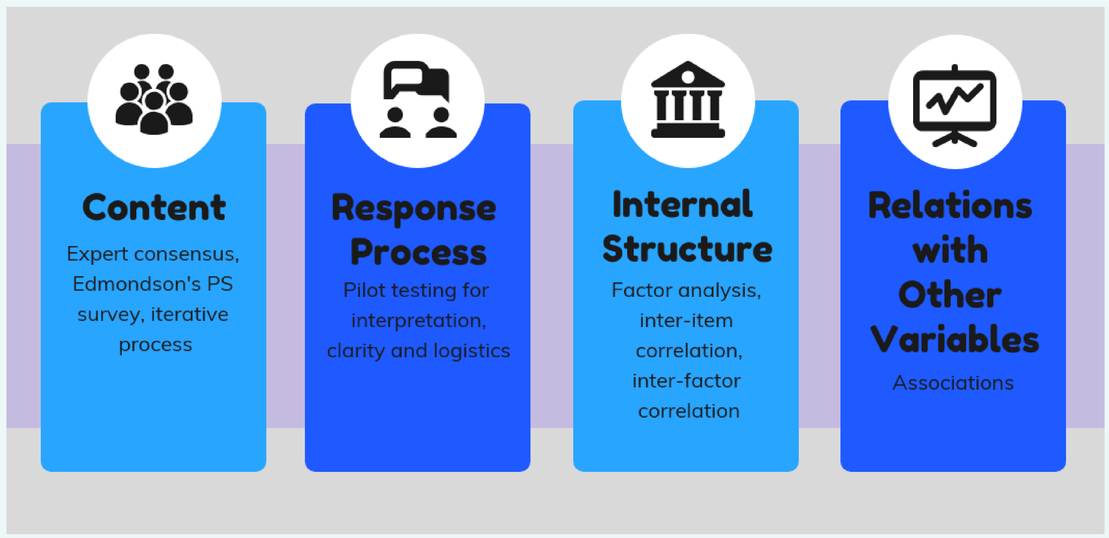
To develop and validate a tool to assess group learning environments pertaining to Psychological Safety using morning report as the exemplar

Conceptual Framework: LEAF

In **Team Psychological Safety model**, learning is achieved by the learner promoting five core learning behaviors: feedback seeking, help seeking, speaking up about concerns and mistakes, innovation and boundary spanning.

Learning outcomes are operationally defined by Norman Webb's Depth of Knowledge from recall and reproduction (what is the knowledge?), skills and concepts (how can the knowledge be used?), strategic thinking (why can the knowledge be used?), and extended thinking (how else can the knowledge be used?)

Messick's Framework for Validity Evidence



LEAF Tool (n = 393)

We collected 393 responses administered during 25 randomized MR sessions from 12/18 -7/19

Team Psychological Safety

Cronbach's Alpha

1. When someone makes a mistake, it is often held against him or her.
2. It is easy to discuss difficult issues and problems.
3. Participants are sometimes rejected for having different opinions.
4. It is completely safe to take a risk in discussion.
5. It is difficult to ask other participants for help.
6. No participant deliberately undermines another participant.
7. Participants value and respect each others' contributions.

0.82

0.27*

Team Learning Behaviors

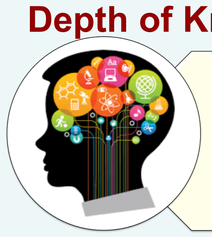
1. Participants seek feedback from one another through discussion.
2. Difference of opinion are handled as teaching opportunities.
3. Problems/errors are communicated appropriately so that ongoing issues are addressed.
4. Participants seek new information that leads to important changes in our plans/processes.
5. Participants talk about mistakes or misconceptions and their potential solutions.
6. Participants raise concerns they have about plans or decisions.
7. Multidisciplinary views are presented and discussed.

0.91

0.59*

0.22*

Depth of Knowledge



1. State medical facts, principles or rules pertinent to clinical scenarios(s) presented.
2. Explain how concepts and skills can be used to solve clinical scenario(s) presented.
3. Draw conclusions from observations/reasoning/evidence discussed, and apply them to variations of the same clinical scenario(s).
4. Formulate generalized knowledge and strategies, and apply them to solve different clinical scenario(s).

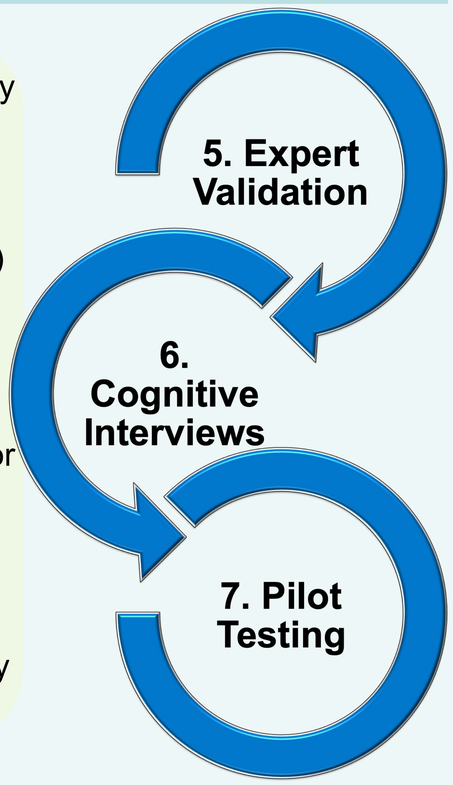
0.94

*Inter-factor correlation

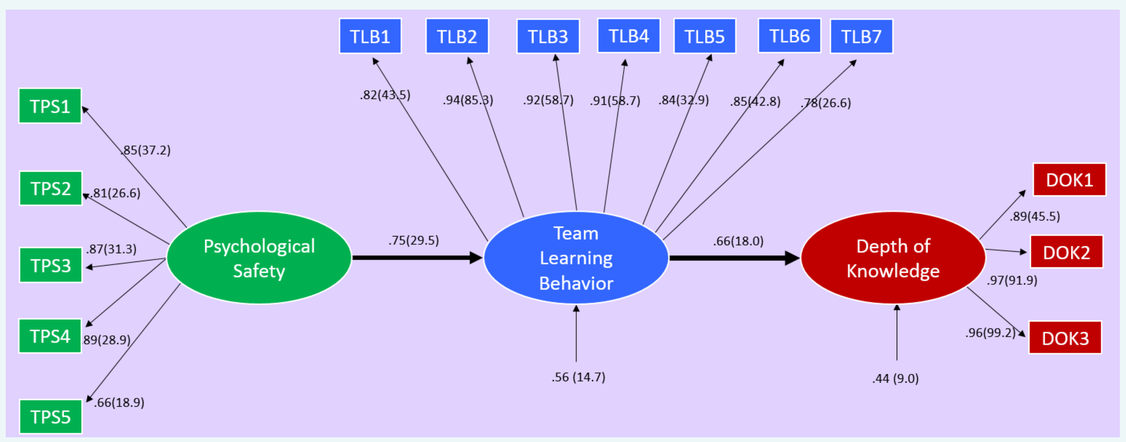
Tool Development

1. Literature Review
2. Interviews
3. Conceptual Synthesis
4. Item Development

- 7-step process for survey creation
- Team Psychological Safety (TPS) and Team Learning Behavior (TLB) models by Edmondson with addition of Webb's Depth of Knowledge (DOK) to formulate the conceptual framework for the tool
- Iterative process to eliminate redundancies, expand concepts and revise items for accuracy and clarity



Confirmatory Factor Analysis (n = 203)



*Standardized root mean square residual (SRMR), Root mean square error of approximation (RMSEA), Comparative fit index (CFI)

SRMR = 0.034, RMSEA = 0.088, CFI = 0.987

Conclusion

- We developed the LEAF Tool based on Edmonson's Psychological Safety Survey
- Preliminary data suggests acceptable evidence to support the validity of the Learning Environment Assessment Framework (LEAF) tool

This project is generously supported by the Evangelina "Evie" Whitlock Grant