

Using Cognitive Task Analysis in Primary Care: Transformation through Innovation

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Cognitive Task Analysis in Primary Care

BACKGROUND

Context: Transforming health care necessitates engaging with people who work in and use the health care system. What we think are the issues can be different from what is happening and what solutions are needed. Cognitive Task Analysis (CTA) is a structured set of tools from the cognitive science and systems engineering literature with a long track record of successfully understanding and improving team functioning in many high-stakes settings (e.g. aviation, firefighting, NASA, the military, ICUs).¹

Objective: Adapt and use Cognitive Task Analysis (CTA) to help bring primary care transformation to scale.^{2,3}

Study Design: Co-design, qualitative research. Purposeful sampling.

Setting: Primary Care, Alberta. Participants: Family physicians and primary care patients.

MACROCOGNITIVE PROCESSES

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| | Monitoring and Problem Detection <ul style="list-style-type: none"> Tracking the progress or outcomes of patient care or administrative processes Planned, ad hoc ("noticing"), formal (data collection) or informal |
| | Managing the Unknown, Unclear, Unexpected, and Irregular <ul style="list-style-type: none"> Planned or anticipatory (contingencies, fallbacks) Evaluating/estimating risks Unplanned, "scrambling" |
| | Sensemaking and Learning <ul style="list-style-type: none"> Deliberate attempt to find coherent situational understanding Modifying or generating new understanding Includes sensegiving – helping others make sense of situation |
| | Coordinating <ul style="list-style-type: none"> Synchronizing two or more individuals in a patient care or administrative process to improve performance |
| | Decision-making <ul style="list-style-type: none"> Committing to a course of action about patient care or an administrative process |
| | Planning and Re-planning <ul style="list-style-type: none"> Deliberate sequential shaping or reshaping of a patient care or administrative process |

MENTAL MODEL

A mental model is the lens through which we make sense of what's happening around us. It is more than our beliefs and values and is dynamic in nature. Mental models determine what we pay attention to, what options and possibilities we consider, how we solve problems, and ultimately make decisions and act. They are our understanding of how things work; what actions produce what consequences under what conditions and how and why they do.

SHARED MENTAL MODEL

A shared mental model means everyone on the team has the same lens. When mental models are misaligned team effectiveness can be markedly impaired, and often the team does not clearly understand why.

Study 1: Reducing MRIs for Low Back Pain - Physician Decisions and Patient Experiences

Over ordering of MRIs is caused by a physician knowledge gap and an education campaign is needed

- CTA technique Critical Decision Method¹ used to interview 10 physicians
- The Patient and Community Engagement Research (PaCER) method⁴ used to interview 15 patients

Using CTA we discovered there was no physician knowledge gap

RESULTS

- Two mental models identified among physicians "evidence-based" and "patient-oriented" both included recognizing red flags & using conservative approaches to ordering MRIs
- Physicians order MRIs, when red flags are absent, in response to external drivers (e.g., patient demand, requests from Workers Compensation Board, or referral requirements)
- Patients request MRIs for reassurance and clear diagnosis

CTA HELPED

- Provide insight and direction
- Highlight that time, energy, and funds could be saved by focusing on what the real issue is, not what we thought the issue was

Study 2: Building Partnerships to Improve Care of Early Knee Osteoarthritis Patients

Create a risk calculator tool for physicians to use with patients who have knee osteoarthritis (KOA)

- CTA technique Critical Decision Method¹ used to interview 7 physicians
- The PaCER method⁴ used to interview 7 patients

Using CTA we found physicians & patients do not want a KOA risk calculator

RESULTS

- Physicians & patients would not use a risk calculator tool for KOA, instead they suggested a tool to assist with self-management of KOA
- Physicians had concerns about level of technical skill patients need to operate a mobile self-management tool
- Patients had no concerns about operating a mobile self-management tool and also wanted to use the tool to enhance communication with their physicians

CTA HELPED

- Identify where to focus time, energy and funding: on a self-management tool for KOA that stakeholders wanted and would use
- Change the direction from a risk calculator to patients & physicians co-designing a KOA self-management app

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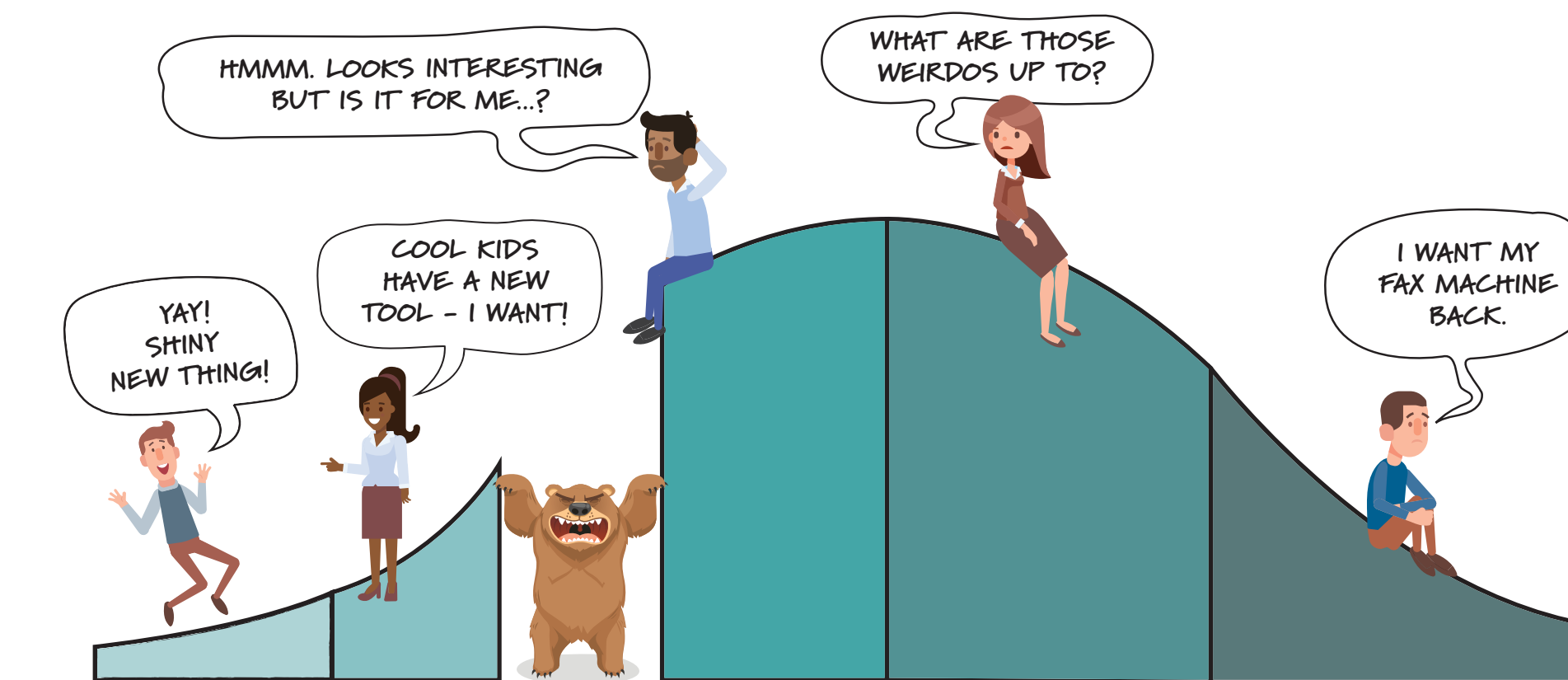
Study 3: Scaling Up Primary Care Transformation in Alberta

A standard approach to implementing the Patient's Medical Home (PMH) will work for all practices in Alberta

- CTA technique Team Knowledge Audit¹ with a focus on Diffusion of Innovations Theory⁵
- 42 interviews (physician & team members) across 18 family medicine clinics in Alberta

Using CTA we found tailored support is needed to engage practices and meet their individual needs in approaching change

RESULTS



Adapted from image source: bussinessillustrator.com⁶

- Identified a distinct spectrum of mental models in how primary care teams organize and deliver care, as well as how teams distribute the macrocognitive processes
- Tailored support is needed to engage early majority practices in adopting the PMH because they approach change differently
- The early majority:
 - > Have not adopted new innovations because the presentation has been framed for the mental models of early adopters, not for them
 - > Require a supportive relationship to help guide learning on how to distribute macrocognitive functions, and trial innovations in small safe steps

CTA HELPED

- Understand the challenges of spread and scale in Alberta
- A realization that to support widespread adoption of innovations in primary health care transformation we need to:
 - > Address the early majority in terms that make sense to them
 - > Recognize that practice facilitation is essential to providing the support the early majority needs

Lessons Learned Adapting CTA to Primary Care

MAIN AND SECONDARY OUTCOME MEASURES:

Adapting CTA for use in primary care has saved time and energy by finding solutions that make sense to those who work in and use primary care. Partnering has helped provide insights around team functioning, how teams adopt change, and understanding patients beliefs to ensure we build initiatives that meet their needs.

CONCLUSIONS:

Using CTA led to an overall impact of real, practical solutions that health care teams and policy makers can use to improve patient care and transformational efforts in Alberta.

Study 4: Physician Champions as a Strategic Resource in Alberta

Physician Champions are a critical strategic resource for health care transformation.

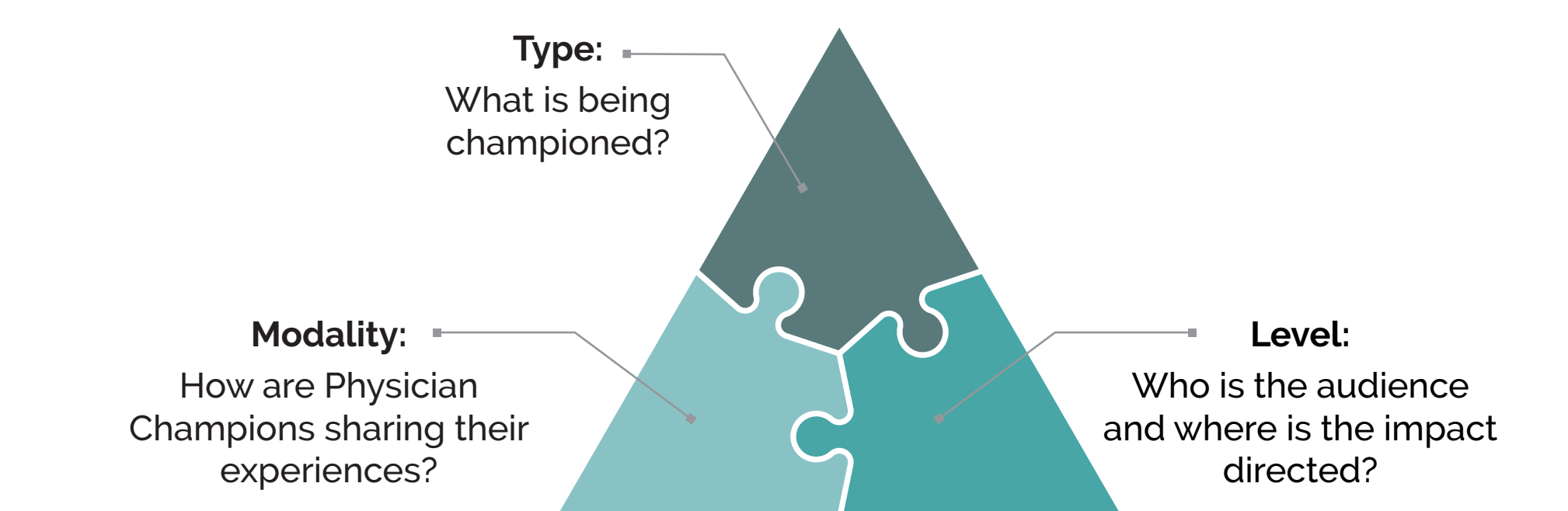
This pilot project was conducted in three phases:

- Phase 1: 22 individual semi-structured, Cognitive Task Analysis interviews
 - > Combination of CTA techniques, Team Knowledge Audit and Shared Mental Model Building¹
 - > 22 interviews with physician champions and selected TOP/AMA members
- Phase 2: Questionnaire to 12 selected participants members to validate themes and gain additional insight
- Phase 3: Working Focus Groups n=3, each with 3 to 5 of those who completed the survey

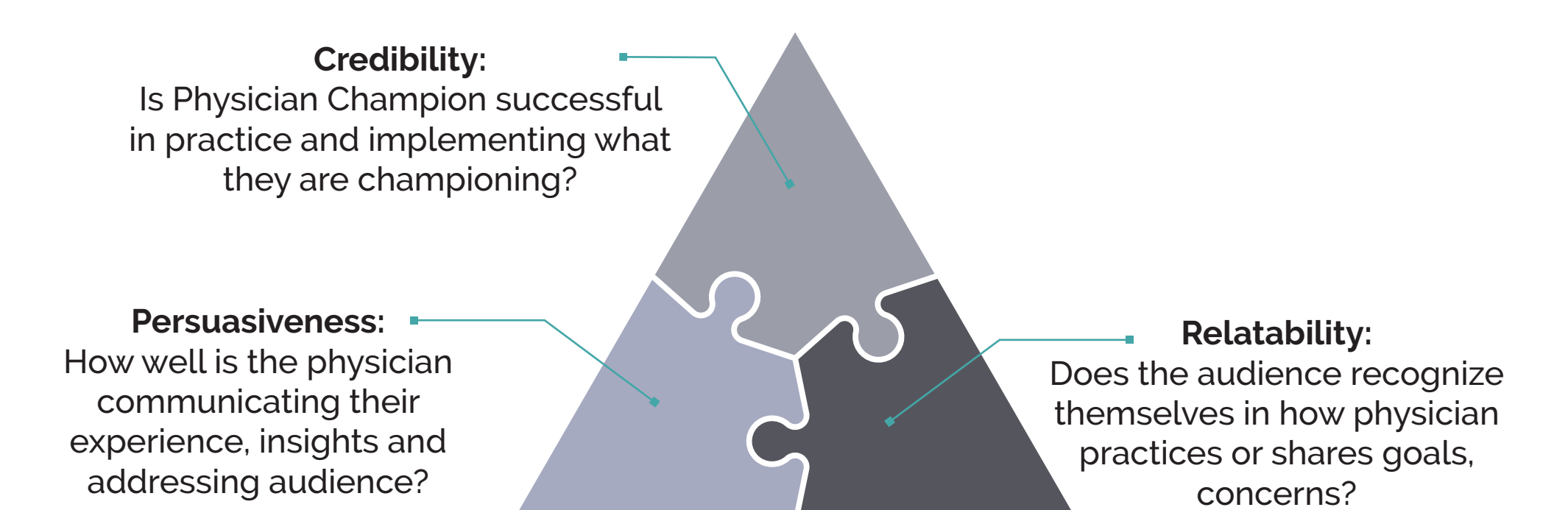
RESULTS

Three frameworks emerged that furthered our understanding of Physician Champions and how to effectively leverage them

Framework #1: Championing Dimensions



Framework #2: Essential Physician Champion Characteristics



Framework #3: Five Processes in Leveraging Physician Champions as a Strategic Resource



CTA HELPED

- Understand that better leveraging Physician Champions requires understanding
 - > Who they are, what they do, who they work with and how, what challenges they face, and why they champion.
- Recognize further research is needed to build a common understanding of the Physician Champion role and how it can be integrated with other Change Agents and supported as part of health care transformational efforts in Alberta.