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# The Ladder of Inference re-visited: "Don't jump to confusions!"
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## L'échelle d'inférence revisitée : « Ne sautez pas aux conclusions »

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Chris Argyris and Peter Senge introduced us to the concept of the ladder of inference[1] in their 1990 book, The Fifth Discipline. When I started my PhD Program in 1994, this was one of the essential reads, and I embraced the Ladder of Inference. While I was committed to its value and efficacy, I have never been able to escape its curse. Making inferences with limited data, constructing stories based on those inferences that we believe are real, and then acting on those narratives (often with negative consequences) is, we have learned, supremely human. I am human too—though in at least this one thing I know I should not be.

Before moving on, let me give a short refresher to the Ladder of Inference, for some an introduction. Humans: do not act on accurate information. Reality does not shape our actions, but our perception of the reality out there shapes our actions. Taking an exhausting post-positivist perspective[2] (partly for the literary effect), I believe there is a reality, but we cannot completely know it. Given the need to act in the world and interact with other humans and our environment, we therefore act on what we believe that reality to be.

The Ladder of Inference describes human behaviours like this example. In a group setting, you see someone you do not particularly admire shrug her shoulders and scrunch up her face a little. You interpret this body language to indicate that she does not care. This interpretation or inference is not logical in the first place. This comes from your own understanding that if people do not care, they shrug their shoulders. However, there are other reasons for shrugging one's shoulders such as they do not know what else to do and feel helpful. This is the classic fallacy of "if p then q; if q then p." Such assumptions may work some or even most of the time but not always. Since in your estimation she does not care, you think she has less than admirable intentions and you like her even less, perhaps to the point of reporting her for unprofessional conduct.

These kinds of inferences affect you in two ways: 1) they limit your quality of life because they are often untrue and being untrue lead to poor decisions with negative consequences. If, as in the example above, you like the person less, she will notice the subtle clues and respond to you in a way that is less open and collaborative. You notice this and the downward spiral gathers momentum all based on an earlier incorrect judgement. You are now stuck in vicious cycles of suffering because you gave value to ideas that have no foundation. If you did file a report, she needs to account for her actions to a supervisor and explain what happened heaping upon her much stress. Adding two and two together we often get…five or unprofessional conduct. Do not believe everything you think!

The rungs on the ladder represent the following:[3]

- Observing what is around you.
- Selecting certain data or information about what you see.
- Assigning meaning to that data or information.
- Coming up with suppositions.
- Drawing conclusions based on your beliefs.

- Taking some kind of action based on these conclusions.

Our beliefs determine how we select certain information and ignore the rest. You do not like her so the shrug stood out to you. We also filter our observations then jump from an observation to a confusion in a millisecond.

The ladder of inference has featured prominently for me recently. At the Medical College of Georgia where I am the Associate Dean for Faculty Development, I am training eight faculty with a total of 1.1 full time effort to coach their peers in small group teaching, our main way to deliver the pre-clerkship curriculum. They learned about the ladder the inference, many of them taking it to heart and exploring applications in many areas of life. Their first training assignment was to "observe" each other and to bring to the person observed what they saw and heard without, as much as possible, inference or judgement. They tried to stay low on the ladder! It is much harder to do than it appears.

Here are the steps you can take to create a more accurate mental model of the reality around us:

- **The first rung of the ladder.** Observe the facts as objectively as possible and do not make judgement or assumptions. Just record what you see and hear.

- **Second rung.** Do not write off any information. Sometimes you get rid of certain information because it does not fit into your particular perspective.

- **Third rung.** When you see things, your brain automatically wants to give them meaning. When you start to assign meaning to things, be critical of your own thought process. Do not believe everything you think. Ask yourself if you need more information.

- **Fourth rung.** Once you start to make assumptions, ask yourself if have based your assumption on the facts that you have witnessed, or on what you believe. Perhaps you will want to investigate further.

- **Fifth rung.** If you have come to certain conclusions, put them through a filter. Ask yourself what else might be going on.

- **Sixth rung.** Behavior. Are you acting on your constructed narrative or on what is really happening?

It is not easy to fight the Ladder of Inference. That challenges our mental models of reality.

I found this passage while reading Eleanor Oliphant is Completely Fine. Here, Eleanor challenges herself and explores alternative reasons why people behave the way they do:[4]

> There's nothing wrong with being overweight, is there? They could be eating because they're sad, the same way you used to drink vodka. They could have had parents who never taught them how to cook or eat healthily. They could be disabled and unable to exercise, or else they could have an illness that contributes to weight gain despite their best efforts. You just don't know, Eleanor, I said to myself.

As we read the articles published in this issue of the CMEJ, note that the authors, in framing their discussion, have worked hard to avoid conclusions that are not supported by the data they found. With the Ladder of Inference in mind, we need to do the same personally and professionally.

## Original Research

Raisonnement clinique et simulation : faciliter la priorisation d'hypothèses grâce aux patients simulés. Données d'une recherche quantitative by Isabelle Burnier and co-authors[5] used a pilot study to test whether simulated patient acting led to prioritizing diagnostic hypotheses using clinical reasoning. Their results showed there was more prioritizing of diagnostic hypotheses for medical students using simulated patients than that of the control group. Therefore, they encouraged further study of the benefits of delivering key elements through simulated patients. This is a French contribution.

Developing a dashboard for program evaluation in competency-based training programs: a design-based research project by Yilmaz et al.[6] identified program evaluation needs related to Entrustable Professional Activity (EPA) assessments and designed dashboard elements to meet those needs. Their dashboards tracked the completion of EPAs to support program evaluation.

The ways social networks shape reflection on early significant clinical experiences in medical school by Samantha Stasiuk and co-authors[7] studied how medical students used social networks outside of curricular time to

reflect and discuss their clinical experiences. They observed that many participants struggled to communicate with those outside of medicine Their study highlighted the importance of meaningful authentic reflection and the need for medical educators to support this type of communication.

Warning: medical education is hazardous to your mental health. Medical students should make an informed decision to begin and continue training by Stacey et al.[8] commented on the prevalence of suicide, substance abuse, depression, and burnout among those the medical education. Therefore, they made a consent form to address mental health risks in medical schools. They hope their satirical article will challenge members of the medical education community to make the necessity of such a consent form obsolete.

Comparing and using prominent social accountability frameworks in medical education: moving from theory to implementation in Northern Ontario, Canada by Brianne Wood and team[9] described and compared eleven well-known social accountability frameworks in medical education and health services research to develop a framework that fits the aims of their specific project. While no one framework met all their criteria, they will combine and adapt components from five frameworks to implement in a Northern Ontario School of Medicine framework.

### Reviews, Theoretical Papers, and Meta-Analyses

Nomenclature of real patients in health professional education by role and engagement: a narrative literature review by Isabelle Burnier and team[10] aimed find the various definitions of real patients involved with medical education to identify their roles and level of engagement better. They concluded that explicitly defining the terms used would help real patients feel more involved in medical education.

### Brief Reports

Implementation of Entrustable Professional Activities assessments in a Canadian obstetrics and gynecology residency program: a mixed methods study by Mueller and team[11] studied how Entrustable Professional Activities assessments are used by residents and faculty in the obstetrics and gynecology residency training programs at a Canadian university. They wanted to determine the opinions of both residents and faculty of the implementation of this tool. Neither residents nor faculty found that EPAs improved feedback.

### Black Ice

Moving toward co-production: five ways to get a grip on collaborative implementation of Movement Behaviour curricula in undergraduate medical education by Tamara Morgan and team[12] presented strategies to integrate movement behaviour curricula in Canadian undergraduate medical education. Their strategies focused on collaboration and co-production of medical education stakeholders to create relevant and feasible curriculum changes that include movement behaviour guidelines.

Emma Faught and co-authors wrote Five ways to counter ableist messaging in medical education in the context of promoting healthy movement behaviours.[13] They emphasized shifting the tone of movement behaviour messages in medical education to provide more inclusive and accessible care for persons living with disabilities. They outlined simple steps to counter ableist messaging such as learning and promoting movement in non-standing postures.

### You Should Try This

A virtual rural medicine self-learning module for preclerkship students by Celina DeBiasio et al.[14] described a virtual self-learning module (SLM) aimed to increase students' interest in and experiences with rural medicine careers by enhancing their abilities to provide compassionate care during these placements. Their module improved students' knowledge about rural health issues and encouraged consideration of rural career options.

Erica McKenzie and team wrote, "R1 Nightmares": a resident-led on-call medical emergency simulation course for junior residents.[15] They described an on-call emergency simulation course aimed to reduce anxiety surrounding on-call medical emergencies for junior medical residents. The participants reported that the course increased their comfort with acutely deteriorating patients. All participants agreed or strongly agreed that they would recommend the R1 Nightmares course for future residents.

### Canadiana

Canadian fellowship experience: the different challenges and emotions faced by an International Medical Graduate and mitigation strategies by Belfiore and team[16] proposed strategies to help International Medical Graduate (IMGs) students transition when starting a Canadian fellowship. Belfiore and team contended that creating a space of empathy and understanding for IMGs adjusting to a new

country will ultimately lead to better education and patient care outcomes.

The training and credentialing of physician informaticists in Canada by Yan et al.[17] commented on the need for accredited Clinical Informatics training programs to meet the need for Canadian physicians to have expertise in health information technology.

## Commentary and Opinions

Issue of poor student-faculty relationship in Indian medical education by Garg and team[18] discussed medical education in India. They highlighted the need for a more positive relationship between medical students and faculty.

## Works in Progress

Medical student stress, burnout, and workplace factors by D'Eon et al[19] outlined a longitudinal study that will measure and show relationships among stress, burnout, and psychosocial factors Their study intends to provide information and insight for future wellness initiatives at medical schools in North America.

## Letters to the Editor

Anna Karwowska wrote a letter, Re: "Warning: medical education is hazardous to your mental health. Medical students should make an informed decision to begin and continue training"[20] on behalf of the Association of Faculties of Medicine of Canada (AFMC), responding to Stacey et al.'s previously published article on the mental health risks in medical education.[8] Karwowska expressed AFMC's commitment to wellness and healthy learning environments in medical education.

## Images

Takotsubo Cardiomyopathy, created by Katerina Schwab, is our cover art.[21] She incorporated an octopus within the image of a heart because the diseased is named for the shape of a Japanese octopus trap. This digital art was part of the Heartfelt images contest for the 2022 WHITE COAT WARM HEART exhibit.

Finding meaning in mud by Christen Rachul[22] presented a photograph of a ceramic pot. Rachul compared the process of completing medical education research projects to the process of making a clay pot from mud.

Enjoy!

Marcel D'Eon
Editor-in-Chief

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