

## How Ergonomic Change Happens: The Practices of Canadian Ergonomists

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**Objectives:** Our research group is undertaking a study of the professional practices of ergonomists and engineers with respect to the development of work systems. The project examines current practice with the intention of supporting future work on the integration of health and safety into work system development. By examining the use of tools, this project is generating an understanding into the information that supports both the decision making process as well as the factors that influence ergonomic knowledge flow and exchange in the workplace. This presentation focuses specifically on professional practice of Canadian ergonomists.

**Methods:** The analysis is based hour-long, semi-structured interviews with 20 ergonomists from across Canada.

**Results & Discussion:** While all ergonomists are interested in contributing toward positive change in the workplace, there are variations in the nature of projects ergonomists take on and their approach to these projects:

*"I'd like to think that our group is hired for expertise and opinion, but at the same time, in probably, I would say, all business, if you don't have a number you don't have much for some of them."*

- (Ergo-A. External perspective)

*"I try as much as possible to measure, to quantify and to compare with guidelines rather than just to give opinion. So, that it's more validated, it's more reproducible, it's more solid data to base decisions on."*

- (Ergo-B. External perspective)

*"...in the role that we have, we are expected to influence rather than to just say 'Look, this is unsafe and this is what you must do'. So, a lot of our energy is spent in the consultative, influencing kind of role rather than 'Here's your problem, we've solved it, these are your options, now go do it.'"*

- (Ergo-C. Internal perspective)

Some ergonomists focus primarily on identifying ergonomic risks at the work station level. Others direct greater attention to solution building, that is to addressing underlying system and organizational concerns that are at the root of health and safety issues. Problem definition typically is grounded in quantitative data, such as biomechanical measures, while solution building involves an expansion into solution development, often examining a broader range of concerns and placing less emphasis on quantification of risk. In terms of workplace development, the implication is that solution builders are better positioned to effect meaningful change. Solution-focused ergonomists are most often "in house" practitioners with a longer timeline and substantial opportunity for relationship-building activities that support implementation of change. Problem-focused ergonomists more often work as external consultants, who, perhaps due to a shorter timeline and less familiarity with the organization, experience more difficulty functioning in a solution-focused mode. While they may be well aware of the systemic basis of a problem, often their clients prefer that they focus on problems at the workstation-level, presenting numerical arguments as the rationale for their recommendations. However, some consider the quantitative approach more systematic, unambiguous and scientifically valid and choose this approach purposefully.

In the larger project the analysis presented here will be extended to include interviews with Swedish ergonomists allowing an international comparison of ergonomics practice. We are also currently initiating interviews with professional engineers responsible for work system design and aim, again, to include Swedish engineers. Sweden, arguably, has a long tradition of attending to ergonomics in workplace design and national differences in practice may reveal new avenues for integrating OHS issues into Canadian workplace development by improving the cooperation between engineers responsible for workplace performance and professional ergonomists.

**Conclusions:** Ergonomists' location as either "in house" or external consultants conditions their ability to function in a solution-focused or a problem-focused mode. Difficulties facing external practitioners include limited opportunity to: 1) follow up on recommendations, 2) establish strong working relationships, and 3) influence an organization's commitment to change.

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## Background

- Larger study
  - professional practices
  - human factors and work systems
- Interviews
  - Ergonomists (N= 22)
  - Engineers (ongoing)
  - Semi-structured; transcribed
- Swedish component for ergonomists (N=15)

## How Ergonomists Work

- Role definitions
  - What they bring to the workplace; workplace parties
- Orientations toward tools and data
  - Kinds of data gathered
  - How it is used
- How tool use informs practice

## Sample: 22 Ergonomists

- 12 men; 10 women
- Type of Employment
  - Employees (55%)
  - Independent consultants (45%)
  - Academic affiliation (27%)
- Based across Canada
- Varied employment sectors

## Role Definitions

- What they bring to the workplace; workplace parties
- Variation; within individuals and across sample
- Some broad themes

## Theme: Broad Consultative Role

In the role that we have, we are *expected to influence* rather than to just say 'Look, this is unsafe and this is what you must do'. So, a lot of our energy is spent in the *consultative*, influencing kind of role rather than 'Here's your problem, we've solved it, these are your options, now go do it.' ... (Job is) to try to *influence people to move in the right direction*. This would be along the lines of doing the necessary *small 'p' political maneuvering* to get oneself onto (a committee in the worksite); ... if you have an ergonomist sitting there, you can have input.

### Theme: Broad Consultative Role

I describe myself to the crews I talk to as a *job coach* for an industrial athlete.... So my role *with the employee* is to try and coach them as best I can on body mechanics, so they can make good choices at work; and then in dealing with *supervisors and management* on trying to do a little bit of, let's say, leadership coaching on how they can incorporate musculoskeletal principles into their observations and conversations with their crew; and then at the *senior management level* I try to help them figure out how they can incorporate ergonomics into their business and safety processes.

### Role Definitions and Data: Contrasts

- "I think of myself as a *facilitator*. Trying to get them to *come up with solutions*. Certainly data collection and analysis is a huge *part of my role*, but more and more it's to try to get them on board, to understand each other, and to be committed to the process."
- Role is to offer "*third party objective opinion, so we measure everything.*"

### Contrasts: Role and Use of Data

- Role of data
  - Kinds of data gathered
  - How it is used
- Data collection distinguished from role of "getting people on board"
- Measurement as central to role of providing "objective" opinion

### Data: Nature and Uses

- Quantitative data
  - Biomechanical tools
  - Software, etc.
- All respondents gather data; uses vary
  - As basis for professional judgments
  - To support arguments

### Primary Basis for Professional Judgment

- "It gives a number, so it's quantifiable. You can compare it to guidelines and be able to tell an employer that this is safe or unsafe."
- Tools and methods that are quantifiable are "very important"
- "*I try as much as possible to measure, to quantify and to compare with guidelines rather than just to give opinion. So, that it's more validated, it's more reproducible, it's more solid data to base decisions on.*"

### Uses of Data to Convince

- "I think measuring tape is ... *pretty necessary*. You need to get your horizontal distances, your vertical distances... It's also *how people communicate, especially engineers*, they want to know inches and centimeters, they don't want elbow heights and things like this. So they want some *sense of a realism to it.*"
- (Respondent uses) "lots of numbers because if you go back to the engineer - in 90% of my projects there's an engineer somewhere - and if we give them just words, it doesn't work. *If we give them numbers, graphics, then 'ahhh', they understand.*"

### Limitations to Data

- A lot of new ergonomists ... put a lot of weight on biomechanical analysis software or some limits about what's considered heavy lifting and things like that. *This science, when you get to applying it, isn't that black-and-white....*

### Limitations to Data (continued)

*You can't say that someone's injury didn't arise (from) their job simply because one guideline or biomechanical analysis software says that the maximum weight you had to lift in that job wasn't too much for most people. It doesn't address all of the other things that they do in their work as well as the fact that they're an individual with individual capabilities and weaknesses and so on. It gets into a real tricky thing when you start looking at the tools and guidelines and things that ergonomists are using.*

### Professional Judgments and Uses of Data

I often don't have to go through a lot of tools because *the relationship I have with my clients is such that I give them my professional opinion and judgment and they often run with it.* And if more tools and objective measurements are required I'm happy to provide it, but often times we're not talking about projects en masse that require a lot of that stuff.

### Discussion: Measurement vs. Consulting

- No clear distinction
  - prototypes (ideal types) realized variously in practice
- "It depends"
  - organizational culture
  - place of ergonomics
  - specific mandate
- Majority try to influence work organization, culture
  - variations within and across individuals
  - data as a means to do this
  - but "real tricky thing when you start looking at the tools and guidelines and things that ergonomists are using."

Thank You