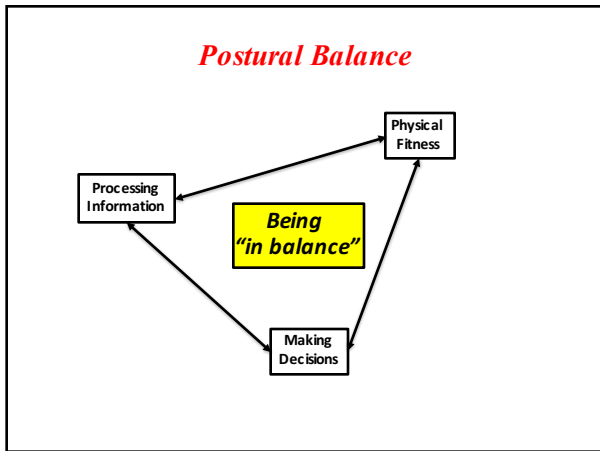


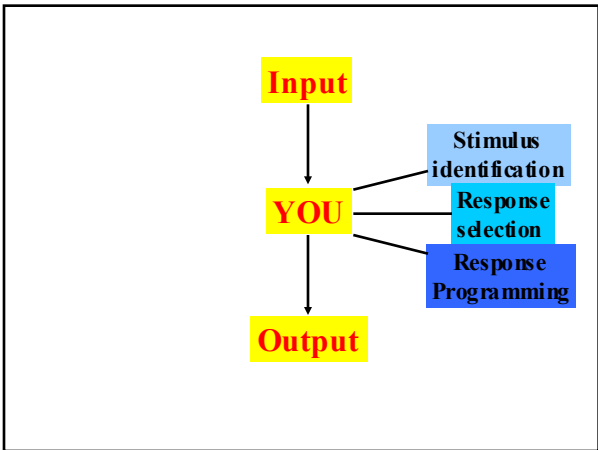
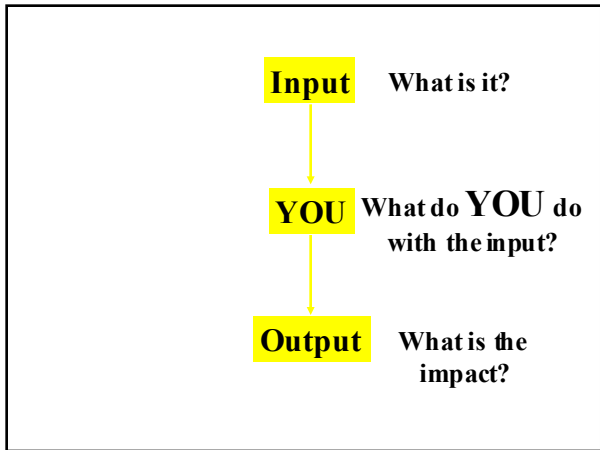
*"Balance is the Essence of Movement,  
and Movement is the Essence of Life."*

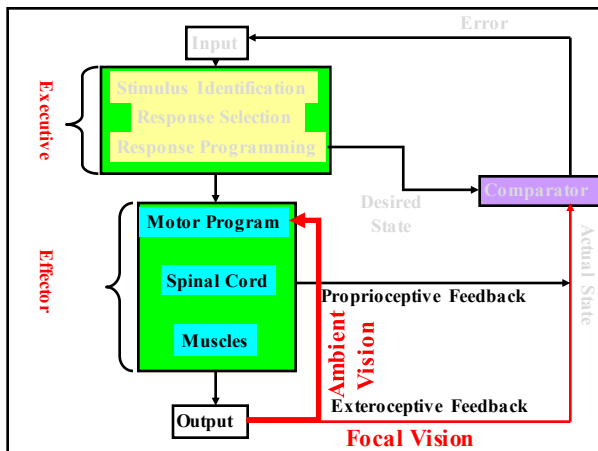
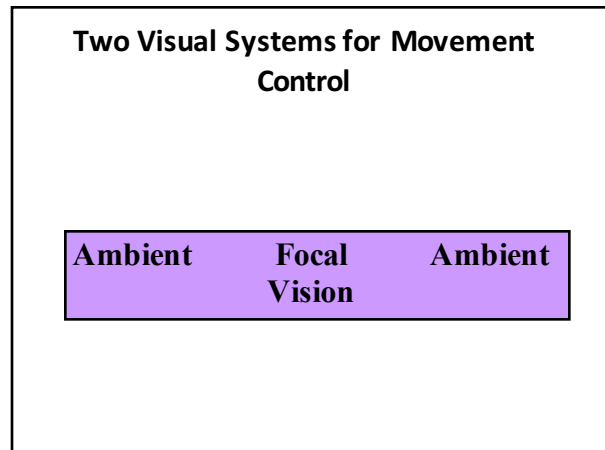
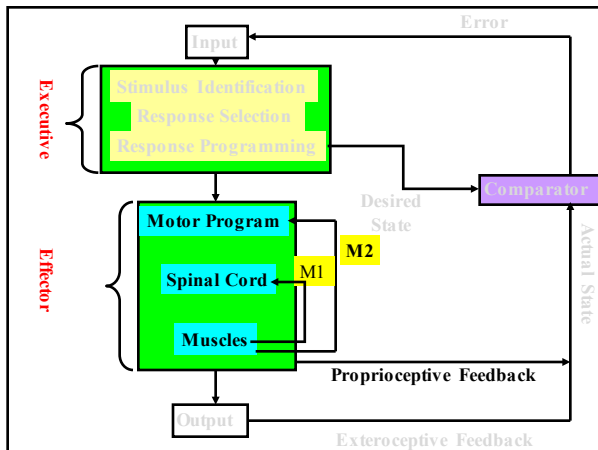
Jochen Bocksnick, Ph. D.

- ### NOTES
- Please, feel free to also view the presentation accompanying video clips on YOUTUBE
    - Video clips 1 to 11: [https://www.youtube.com/edit?o=U&video\\_id=LF471dw13So](https://www.youtube.com/edit?o=U&video_id=LF471dw13So)
    - Video clip 12: [https://www.youtube.com/edit?o=U&video\\_id=njM92Q7ILp8](https://www.youtube.com/edit?o=U&video_id=njM92Q7ILp8)



### VIDEO CLIP 1





VIDEO CLIP 2-6

***Balance?***

***.... is an outcome of ...***

- the ability to maintain the body's position over its base of support.
- Static and Dynamic Balance

(Generalized) **Causes of Falls**

"It's very frightening to hear (see) someone fall down the stairs."

**Inability to correct for the unexpected loss of balance**

**Stimulus that results in the loss of balance**

**“Falls Risk Factors: Assessment and Management To Prevent Falls and Fractures”** (Martin, 2011)

- **A clinician’s perspective**
  - Do Peter, Paul, and Mary have any indicators that will suggest the possibility of falling?
    - Making a prediction - the possibility of being wrong!
  - How to intervene, when there are shortcomings

**“Understanding falls as a geriatric syndrome”**

- “For an older person, a fall may be a trivial or profound - even fatal - event” (Martin, 2011, pg 34)
  - Falls are not unusual events

Martin, 2011

**Findings on “Balance”**

- Many “older” people cannot maintain balance on one foot.
- Many “older” people do not have the ability to regain balance after it is lost.
- **Worse, many “older” people fear the possibility of falling.**

Betens & Betens (2008)

**Risk factors --- Balance deficit**

- **Visual impairment** (distorting acuity and contrast sensitivity)
  - degraded & distorted
  - depth perception
  - peripheral vision (anterior-posterior sway)
- **Vestibular system**
  - Vestibular neurons decrease both in numbers and size
- **Somatosensory system**
  - Information about touch and vibration

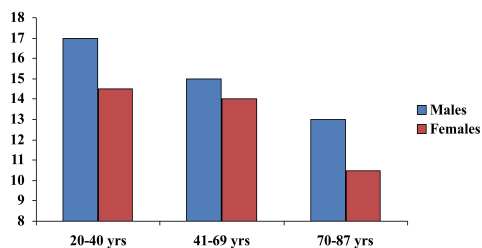
**Risk factors – continued –**

- Lower limb **weakness**

**“Weakness”**  
Experiencing Falls a Matter of Fitness?

■ Vigorous	■ 17%
■ Transitional	■ 32%
■ Frail	■ 52%

### Age and gender differences in the Functional Reach Test



Note: Reach in inches

#### Risk factors – continued –

- Balance deficit
- Gate abnormalities
- Mobility limitation
- Cognitive impairment (multitasking)
- Impaired functional status
- Postural hypotension (orthostatic)

#### ■ “Falling” is not the same for everyone

– “The effects of falling on subsequent health and well-being appear to be partly due to the negative impact of falling on perceived control and optimism.

Specifically, *it is likely that suffering a fall erodes older adults’ global sense of control* in terms of how much influence they perceive they have over various areas of life, such as their physical health, social activities, and life in general” (p. 243).

Ruthig et al., 2007

### “Best-of-Five”

- Intervention is required when (3 out of 5):
  - Fall in the previous year
  - Four or more medications per day
  - History of stroke or Parkinson’s disease
  - Self-reported problems with balance
  - Unable to get out of chair at knee height, without using arms (i.e., insufficient muscular strength)

Martin, 2011

### Catering to the individual

- “Risk factors will behave differently depending upon the population in question, the activity, the place, and the time” (Martin, 2011, pg 351)

### VIDEOCLIP 7

- No single tool can be recommended as suitable for falls prediction – in all settings
  - (Expert) observations may have greater ‘validity’ than objective instruments

**“A” picture**

- A clinical picture of an older person with a *higher-level gait disorder*

*A potential fall in waiting*

Martin, 2011

**Poly-pharmacy**

- Balancing the type and number of medications is crucial ...
  - ... not just for the treatment of diseases and conditions but also for the maintenance of postural balance

Martin, 2011

What does BAD postural balance look like?

How will the scope of your “daily activities” change if you have compromised postural balance?

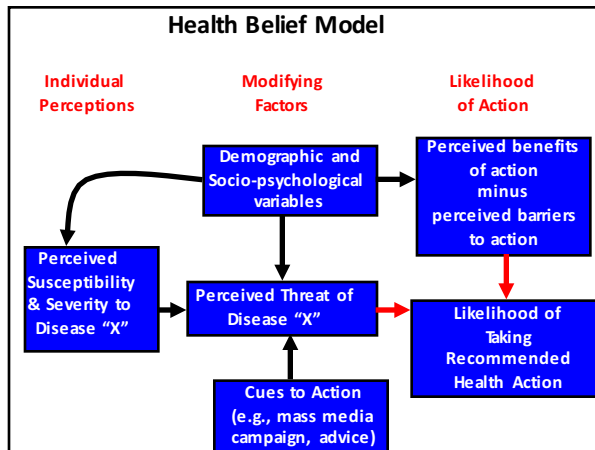
“Falls reduction” vs. “preserving mobility”

**Sending the “right” message**

■ *The Health Belief Model*

A vicious cycle –  
fear of falling and activity avoidance

Bertera & Bertera, 2008



A vicious cycle –  
fear of falling and activity avoidance

“Fear of falling may be understood and examined in the context of threat avoidance logic” (p. 55)

*“I cannot influence my health so ... why engage in physical activity?”*

***This is not a helpful attribution!***

Bertera & Bertera, 2008

*Changing a lifestyle*

Older adults who most need to change may be encountering a cognitive barrier ...

**FEAR**

Exercise Programs as a Strategy to Prevent Falling

The first encounter with exercise at old age is likely to be confirming perceptions of reduced personal ability and may lead to painful results.

Unless ...  
low-skill and low-intensity (initially)

*Fitball Exercise Program*

UofL

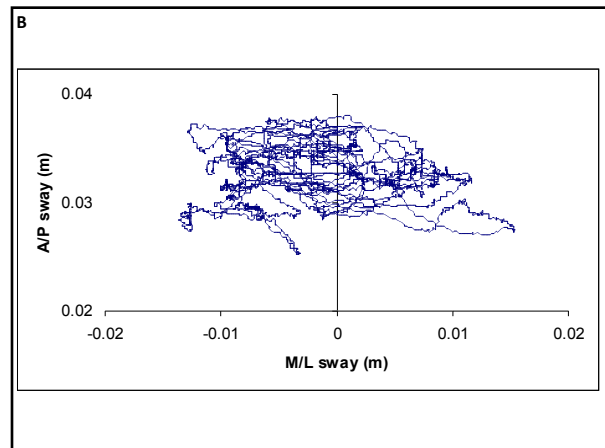
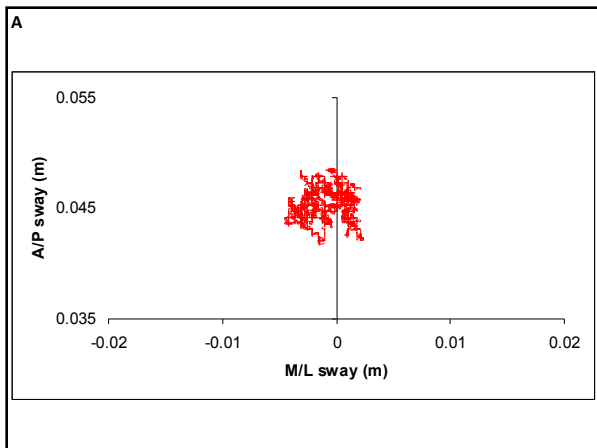
1998 – 20..

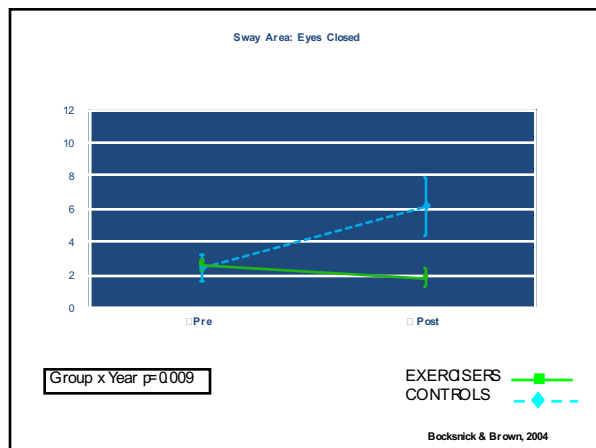
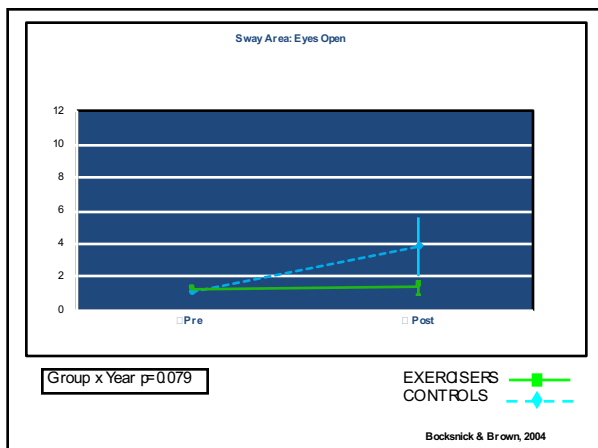
- Exercise program and setting
- Quantitative balance assessments
- Quantified self-perceptions of exercise-related changes
- Qualitative exercise response assessments

- ### Findings
- Exercise program and setting

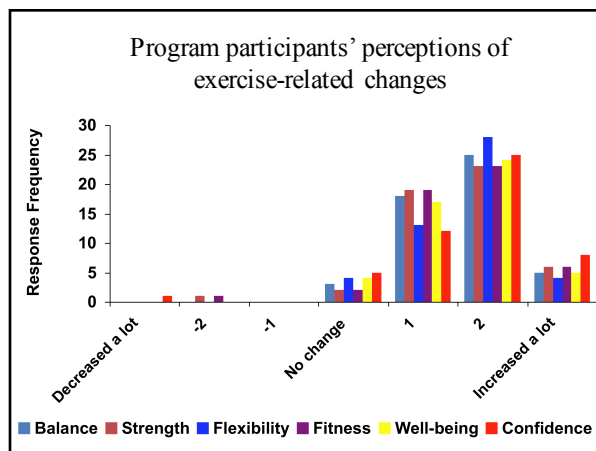
- ### Findings
- Exercise program and setting
  - Quantitative balance assessments

- ### Same subject
- A - 1<sup>st</sup> trial, eyes open, **feet shoulder width apart**
  - B - 1<sup>st</sup> trial, eyes open, **feet in tandem stance**
  - Both figures are on same axis scale and spacing





- Exercise program and setting
- Quantitative balance assessments
- Quantified self-perceptions of exercise-related changes
  - *When I compare my balance as it was a month after I started the program to how it was at the end of my program participation, I would say my balance has...*



- Exercise program and setting
- Quantitative balance assessments
- Quantified self-perceptions of exercise-related changes
- Qualitative exercise response assessments

### Conclusions

- Exercise adherence is more than attendance
- Changes in balance performance (Harry Chapin - "Circle")
- Perceived performance changes
  - *“One change I noticed at home was - before I started the program, when I put my socks on, I leaned against the dresser or sat on a chair. Now I can put my socks on in the middle of the floor.”*



**VIDEO CLIP 8 - 11**

**Video Clip 12**

- “Visuals” of Fitball Class
  - [https://www.youtube.com/edit?o=U&video\\_id=njM92Q7ILp8](https://www.youtube.com/edit?o=U&video_id=njM92Q7ILp8)

**In the “ideal” world ...**

**Exercising/physical activity develops into a  
“pleasurable/enjoyable” activity ...**

**Questions**

**?**

**Concerns**

**!**

**bocksnick@uleth.ca**