Accelerating Motor Learning and Sustaining Outcomes through Support for Fundamental Psychological Needs

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Neurology Section, APTA Combined Sections Conference,
San Diego, California, January 24, 2013

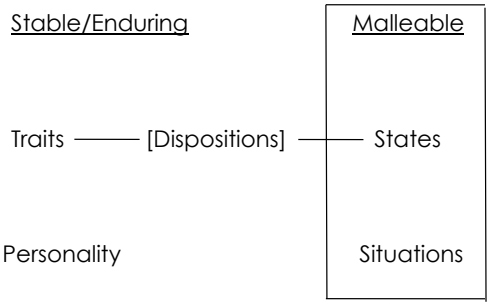
Objectives

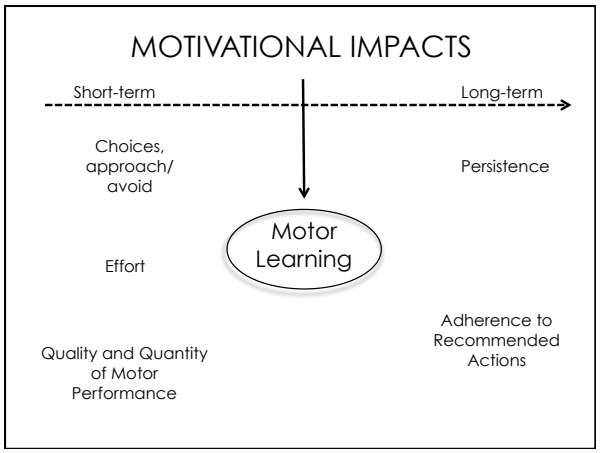
Participants will …

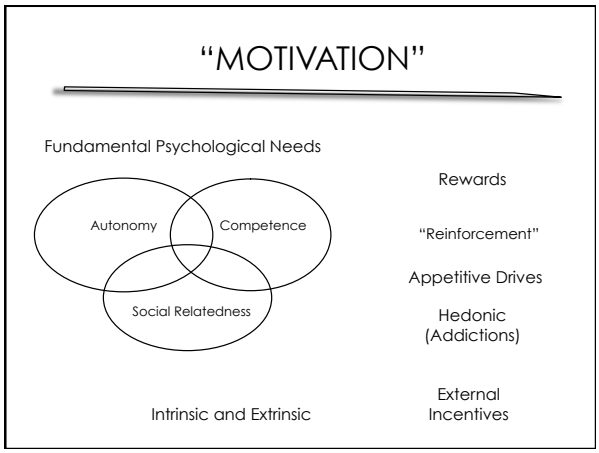
1. be able to summarize research regarding the roles of competence [expectations/self-efficacy], autonomy, and social relatedness in motor learning.
2. be able to identify at least two challenges in the integration of the research evidence into professional education and/or clinical practice.
3. consider a definition of professional expertise that includes skill in supporting patients' fundamental psychological needs.

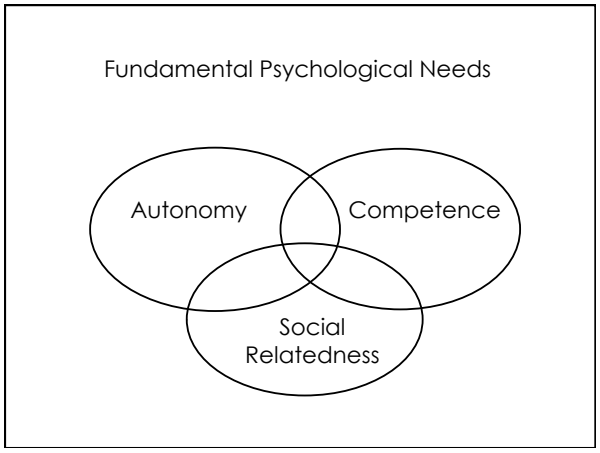
Fundamental psychological needs: A framework for understanding motivation in clinical practice

Motivational "Umbrella"



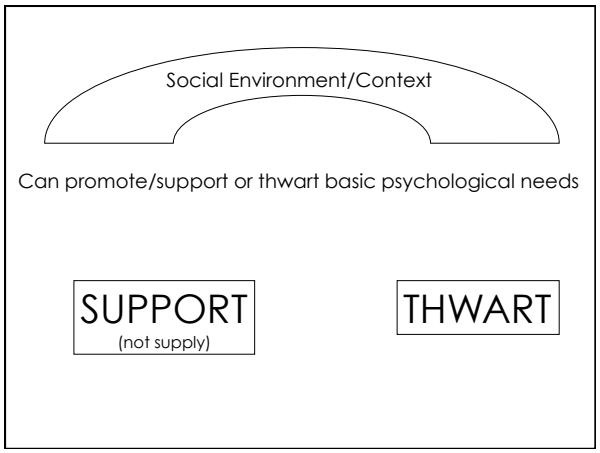






Fundamental Psychological Needs

- Competence: Need to perceive oneself as capable or competent.
- Autonomy: Need to determine or feel in control of one's own actions.
- Social Relatedness: Need to feel included, accepted, or connected to others, to feel satisfaction in one's involvement with the social world.



Building competence/ expectations for motor learning and performance

Fundamental Psychological Needs

* Competence: Need to perceive oneself as capable or competent.

Wulf G, Chiviacowsky SC, Lewthwaite R. Altering mindset can enhance motor learning in older adults. *Psychology and Aging,* 2012.

PARTICIPANTS

Older adults attending a university physical activity program

GROUPS

Enhanced expectancy
"Active people like you, with your experience, usually do very well on this task."

Control

Wulf, Chiviacowsky, Lewthwaite (2012)

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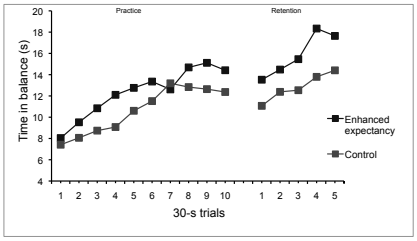
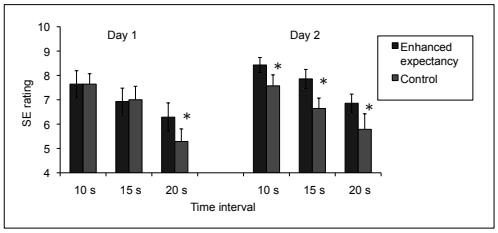


Wulf, Chiviacowsky, Lewthwaite (2012)

Self-efficacy



"How confident are you that you will be able to stay in balance 10 s [15 s, 20s]?"
0 = not confident at all, 10 = extremely confident

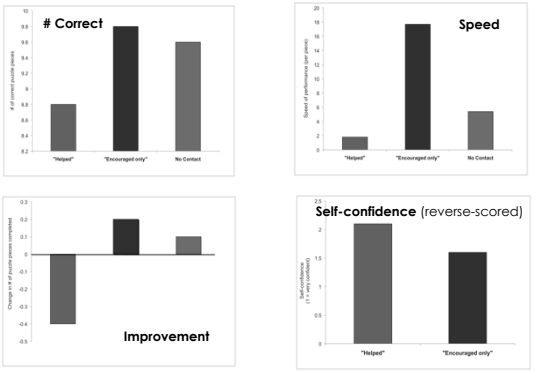
Avorn J, & Langer E. Induced disability in a nursing home: A controlled trial. JAGS, 1982.

- Large 10-piece jigsaw puzzles (requiring eye-hand coordination, manual dexterity, use of strategy)
- Residents of intermediate-care nursing home randomized to one of 3 groups:

  "Helping", "Encouragement Only" or No Contact
- 4 x 20-minute sessions:

  "Helping": encouraged work on puzzle, actively assisted in locating puzzle pieces, suggested where to put them, and often solved the puzzle "with" the resident.

Avorn & Langer (1982). Induced disability



Dobkin BH et al. (SIRROWS). International randomized clinical trial, (SIRROWS), improves outcomes. NNR, 2010.

- RCT in inpatient stroke rehabilitation
- 179 participants randomized, with stratified assignment into one of 2 groups
- Had to be able to follow simple instructions for feedback about walking speed and take 5 steps with <= max assist of 1 person
- Primary outcome measure: self-selected fast safe walking speed (m/s) at discharge, over 50-ft walkway (by blinded evaluator)

Dobkin et al., (2010)

All participants:
- received site's conventional IP rehabilitation
- performed a daily 10-m walk

GROUPS:
Daily Reinforcement of Walking Speed (DRS):
- Fast, safe, walk was timed, feedback and encouragement given:
  - e.g., "Very good! You walked that in (# of) seconds."
  - Then, (a) "This is better by x seconds." or (b) "… holding your own." or (c) "I believe you will soon be able to walk a bit faster."

No Reinforcement of Walking Speed (NRS):
- No timing of walks nor feedback

Dobkin et al., (2010)

RESULTS

Walk time + encouragement > None
Walking speed at discharge (.91 v .72 m/s, p = .01) (21% difference between groups equal at admission)

Walking speed > at 3 months post-discharge (p = .03)

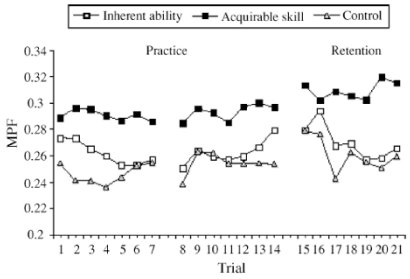
Wulf G & Lewthwaite R. Conceptions of ability affect motor learning. Journal of Motor Behavior. 2009.

- All participants received veridical (true) personal performance feedback (their own error scores, average deviation from the horizontal platform target over a 90-second trial)
- Random assignment to one of 3 groups
- 2 practice days of 7 trials each
- A retention test of learning (no feedback) on third day

Conceptions of ability

- Inherent Ability Group:
  "The balance platform ***measures people's basic natural capacity for balance***… The scores you will be given after each trial, as well as how easy it is to improve, ***will reflect your inherent balance ability***."
- Acquirable Skill Group:
  "… ***balance is a learnable skill***. At the beginning, it is common to have relatively large platform excursions… The scores you will be given after each trial, as well as your improvement across trials, ***will reflect your learning and your 'getting the hang of it.***'"
- Control Group:
  No additional statement

Wulf & Lewthwaite (2009)



Mean power frequency (MPF) of platform adjustments during practice and retention phases. Acquirable skill: more frequent, lower amplitude, adjustments of the platform (i.e., more automatic, reflex-type, movement control).

Building competence/ expectations for motor learning and performance:

Video examples

Autonomy support and outcomes

[Autonomy]

Self-controlled conditions; Controlling vs. autonomy-supportive language

Fundamental Psychological Needs

* Autonomy: Need to determine or feel in control of one's own actions

Subtle conditions that convey freedom of engagement or personal autonomy matter

* Small choices can have large impacts
* Mere choice, incidental choices, can affect learning
* Social interactions and controlling language can threaten autonomy ("I want you to …")

Self-controlled practice conditions vs. yoked conditions

Chiviacowsky S, Wulf G, Lewthwaite R, & Campos T. Motor learning benefits of self-controlled practice in persons with Parkinson's Disease. Gait & Posture, 2012.

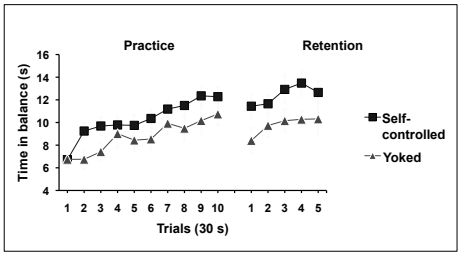
- 28 individuals with PD (H & Y II and III) into 2 groups

  Self-controlled or Yoked use of balance poles

- Primary task was the stabilometer (time in balance)

Self-controlled and Yoked use of balance poles

Chiviacowsky, Wulf, Lewthwaite, and Campos (2012)



"The Renoir Effect"
(Lewthwaite, Chiviacowsky, & Wulf, in prep)

* Primary task was the stabilometer (time in balance)
* Undergraduate Kinesiology students randomized to one of 2 groups:

Choices or No Choices

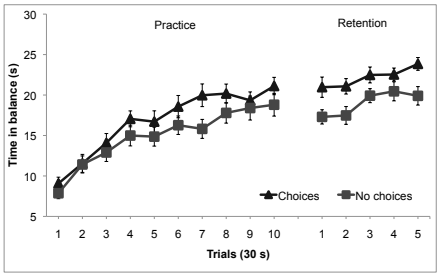
Choices Group: Presented with two choices unrelated to the primary stabilometer task:

(1) 2nd task preference:
a coincident-timing task (Bassin timer) or a force-control (hand dynamometry) task?

(2) Which of two prints of paintings by Renoir they thought the investigator should hang on the laboratory wall.

No-Choices Group: Yoked; told of 2nd task and Renoir print

"Renoir:" Time in balance on the stabilometer



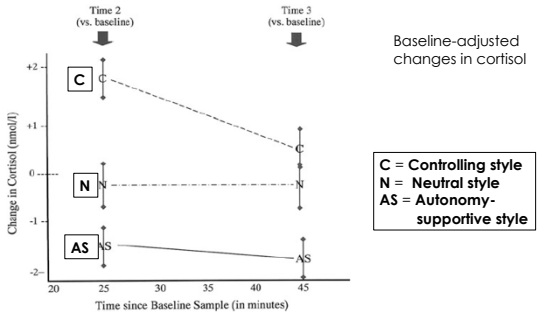
Reeve J, Tseng C-M. Cortisol reactivity to a teacher's motivating style: the biology of being controlled versus supporting autonomy. Motivation and Emotion. 2011.

- 82 undergraduates
- Random assignment to one of 3 groups:
  - Controlling, neutral, or autonomy supportive "teacher"
- Puzzle solving task (time too short to solve)
- Salivary cortisol samples:
  - Baseline rest,
  - immediately after task/manipulation,
  - 20 minutes later

Controlling Style

- Neglect of the learner's perspective
- Intrusion
- Pressure
- "Controlling language"
  - must
  - should
  - have to
  - "I want you to …"
  - "you are accountable for"
  - etc.

Reeve & Tseng (2011)



Baseline-adjusted changes in cortisol

C = **Controlling style**
N = **Neutral style**
AS = **Autonomy-supportive style**

Autonomy

- Small choices, including those unrelated to the motor task, can affect motor learning.
- Self-controlled practice conditions can operate without providing content or strategic learning advantages.
- Thinking "too big" (incompetence) or "too trivially" (disrespect) in choice offered can be problematic.

Autonomy support and social relatedness:

Video examples

Social relatedness in learning and clinical outcomes

[Social-relatedness]

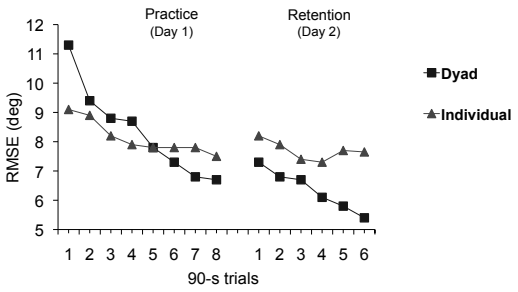
Inclusion,
Acceptance,
Connection,
Collaboration

Shea CH, Wulf G, Whitacre CA. Enhancing training efficiency and effectiveness through the use of dyad training. Journal of Motor Behavior, 1999.

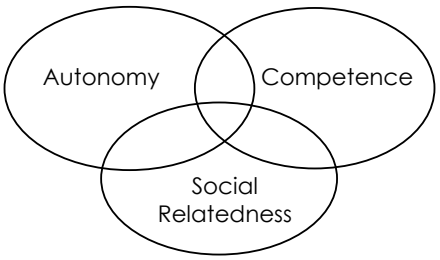
Learning to balance on a stabilometer

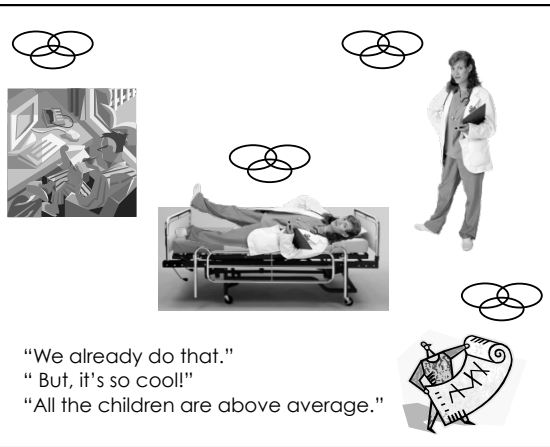
Practiced Individually	Practiced with a Partner (dyad-alternate)
1. Participant 1	1. Participant 1
2. Participant 1	2. Observed partner
3. Participant 1	3. Dialogued
4. Participant 1	4. Participant 1
5. Participant 1	5. Observed partner
6. Participant 1	6. Dialogued
7. Participant 1	7. Participant 1
8. Participant 1	8. Observed partner
	… continued to 8 trials for P1 [P2]

Shea, Wulf & Whitacre (1999)



Fundamental Psychological-Biological Needs





Competence enhancement, collaboration, celebration, positive affect: better motor learning

Discussion

What are the research, practice, and educational implications of this evidence?

Laurie Wishart, DipP&OT, BScPT, MSc, PhD
McMaster University

Carolee Winstein, PhD, PT, FAPTA
University of Southern California

Audience Participation

Question and Answers, Comments

Conclusions

- Motivation affects motor learning, along with many other behavioral, physiological, and experiential outcomes.
- Need to approach development of professional insights and skills in this area with more urgency.
- It's not easy, in part because we all need to feel competent, in control, and respected.

Conclusions

• (Continue to) Redefine what constitutes key professional attributes:

The great therapist is one who (among other attributes) insightfully and skillfully engages patients' intrinsic motivational resources to potentiate recovery.

Featured Articles

Wulf G, Chiviacowsky SC, & Lewthwaite R. Altering mindset can enhance motor learning in older adults. Psychol Aging. 2012; 27; 14–21.

Avorn J, & Langer E. Induced disability in a nursing home: A controlled trial. J Am Geriatrics Soc. 1982; 30, 397-400.

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