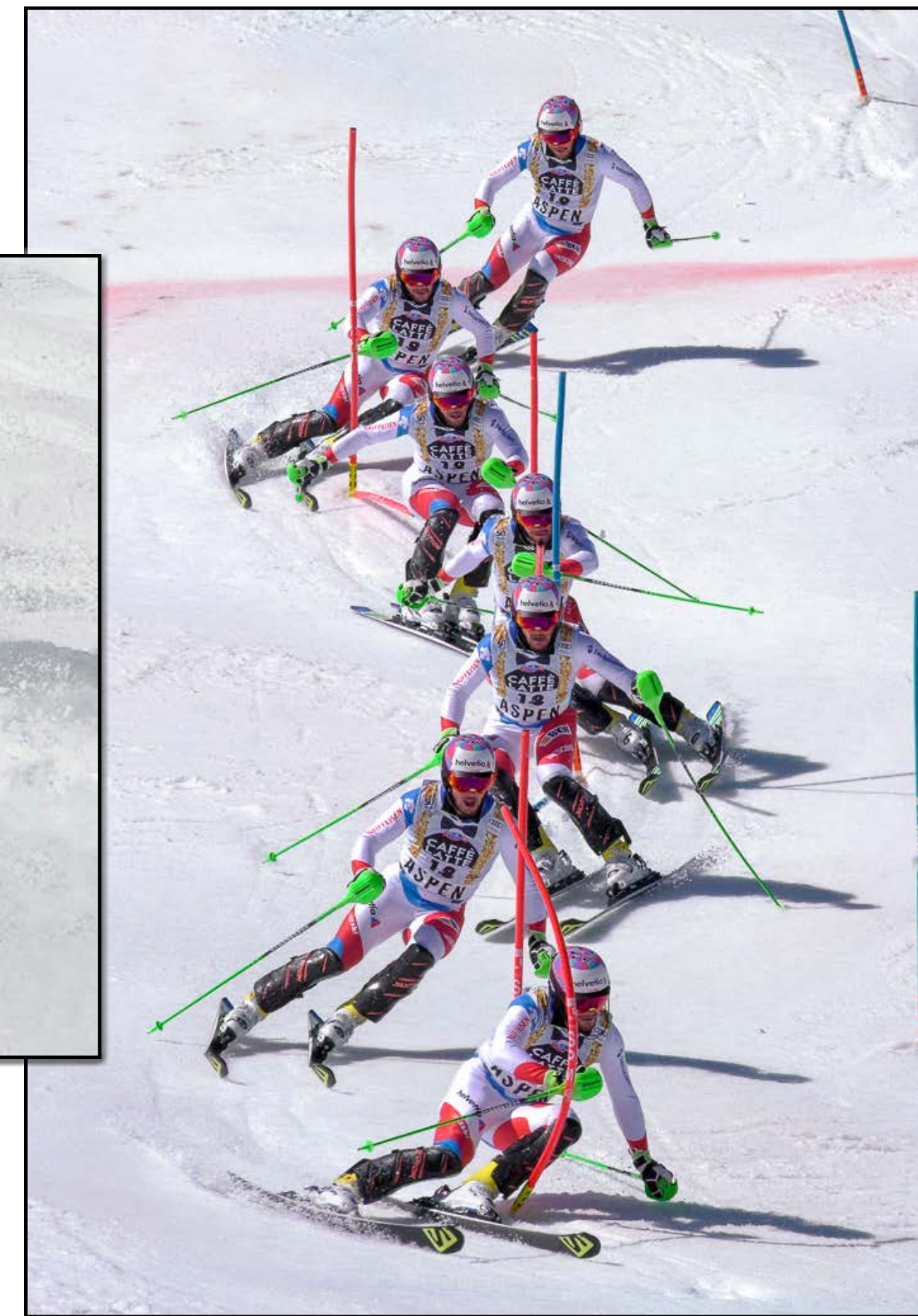


# Rethinking Movement Analysis

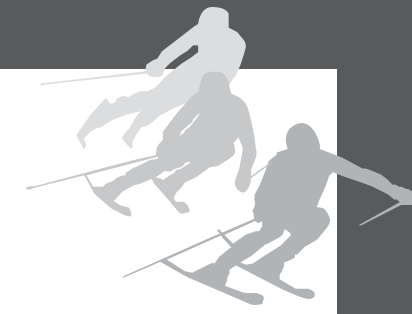
Integrating Tactics, Technique and Teaching

Ron LeMaster  
IVSS, March 11, 2021





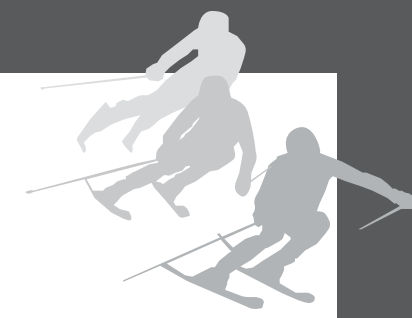
# What is Movement Analysis?



“The process of observing a movement, evaluating the relevance and effect of that movement on other movements and the action of the skis, and prescribing changes for enhanced efficiency, effectiveness, and performance”

PSIA Alpine Technical Manual

# Movement Analysis in Practice

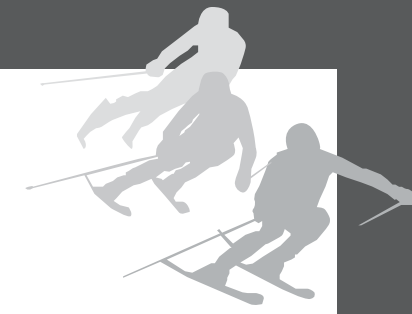


Body Movements



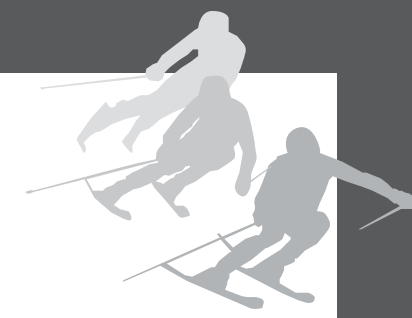
Ski Performance

# Problems with MA as it's Practiced



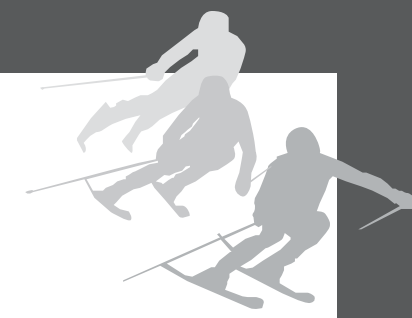
- Focusing on body movements and ski performance is too narrow a view
- "Efficiency, effectiveness, and performance" tend to be based on quality and difficulty of technique, not the skier's actual objectives
- Analysis is often used as the prescription

# Which Turns are Better?



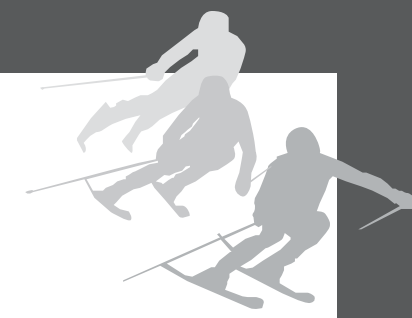


# What Do You Think About?





# What are Skiers Concerned With?

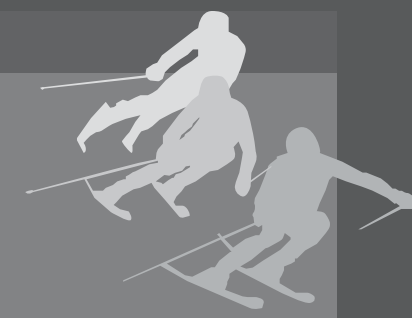


- Controlling Speed
- Controlling Direction
- Controlling Stability
- Having fun





# What are Skiers Concerned With?



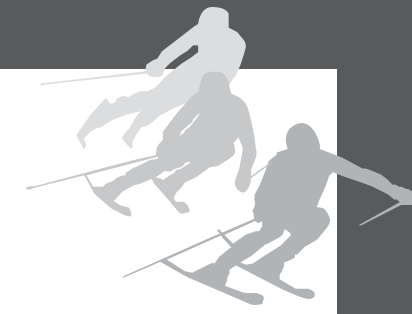
Controlling Speed  
Controlling Direction  
Controlling Stability  
Having fun



Their movement  
down the hill



# What is Movement Analysis?

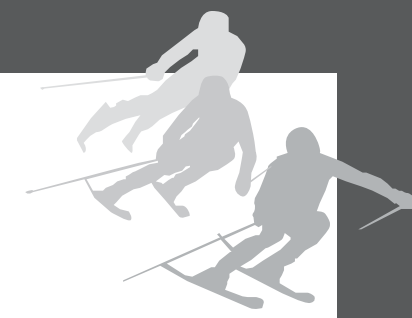


“The process of observing a movement, evaluating the relevance and effect of that movement on other movements and the action of the skis, and prescribing changes for enhanced efficiency, effectiveness, and performance”

PSIA Alpine Technical Manual



# Instructors' and Coaches Concerns



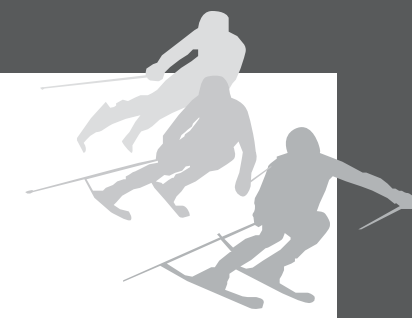
Identifying the correct movement

Giving the correct answer

Passing the certification exam

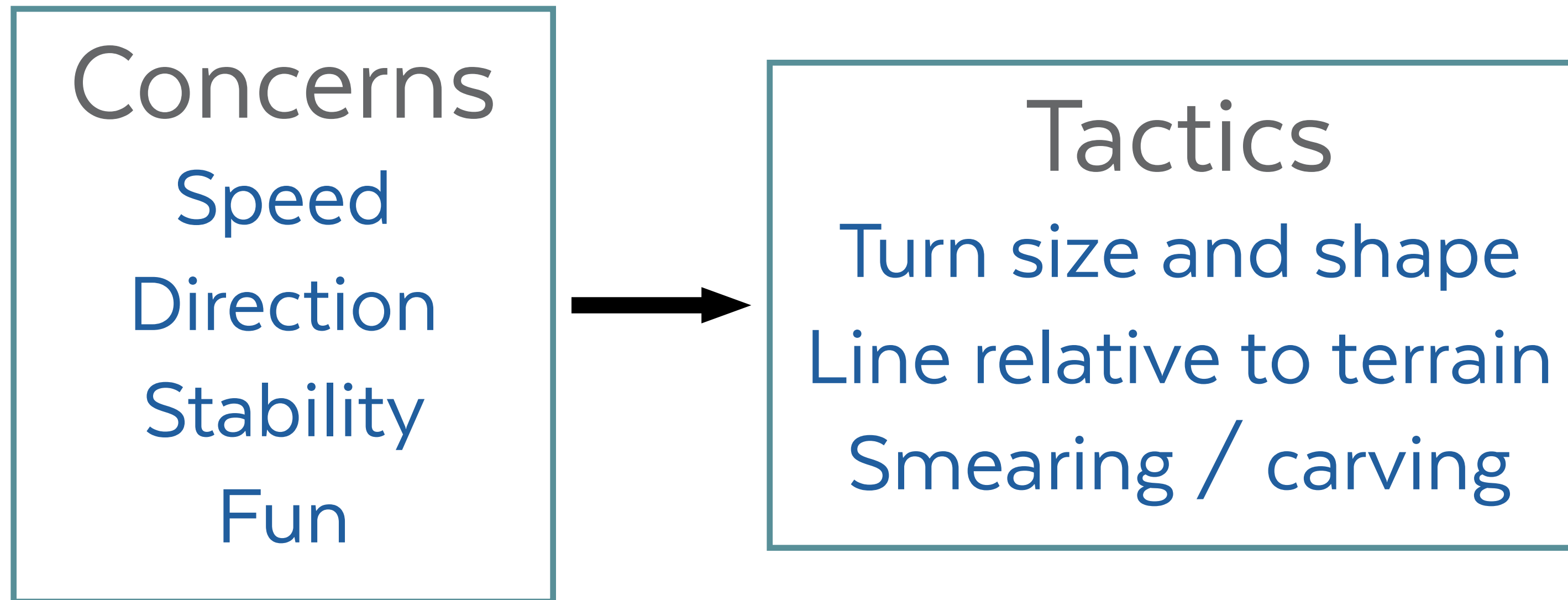
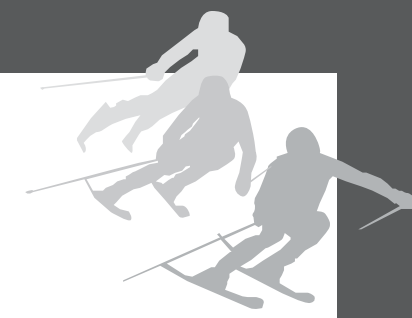






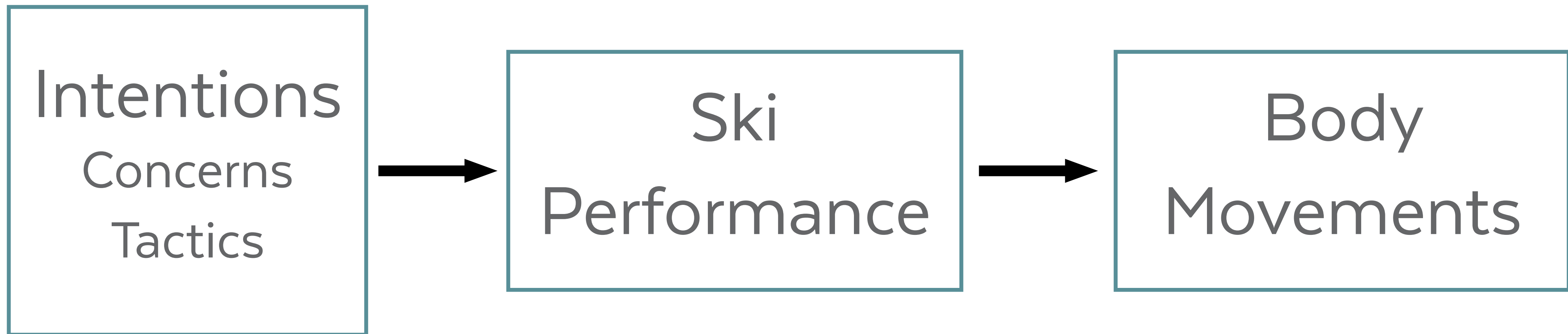
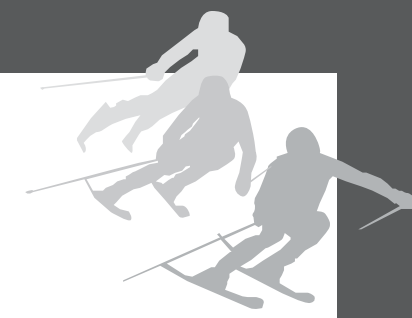


# Intentions



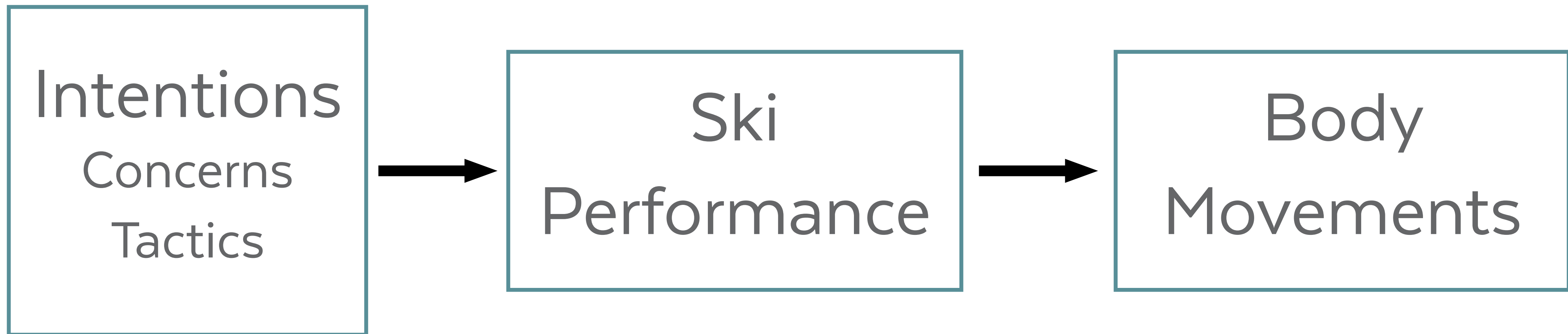
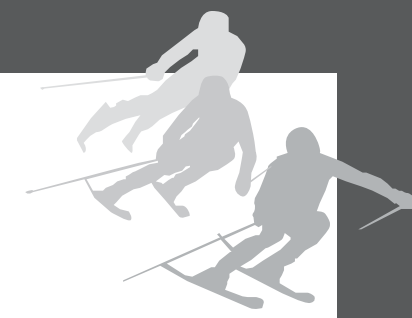


# How Skiing Works



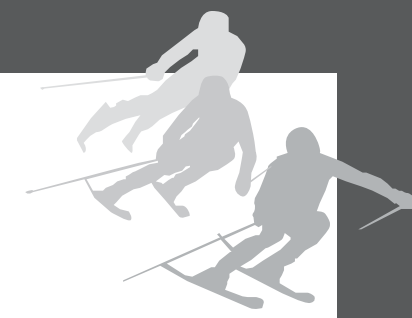


# How Skiing Works





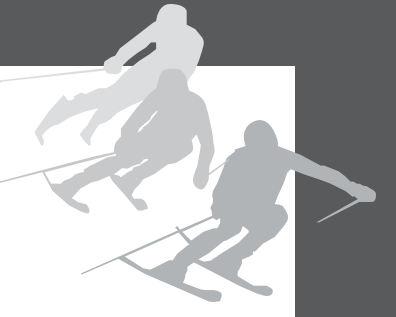
# Intentions and Tactics



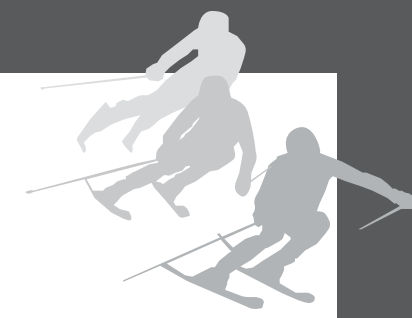
Good skiing requires clear intentions

Without them, a skier's tactics and movements become reactive rather than proactive





# Tactics: Make a Plan



For this run

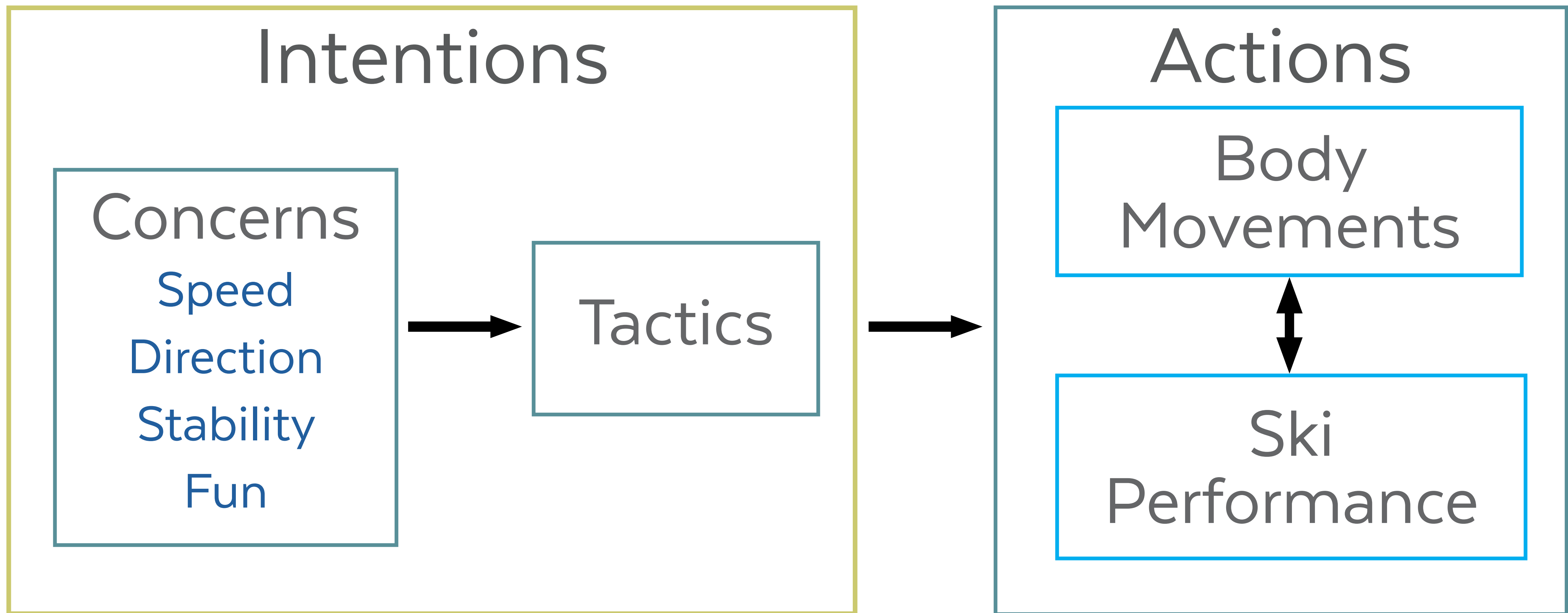
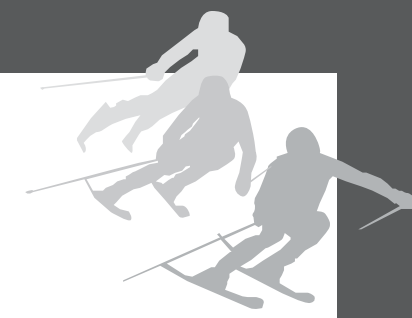
For this pitch

For the next couple of turns

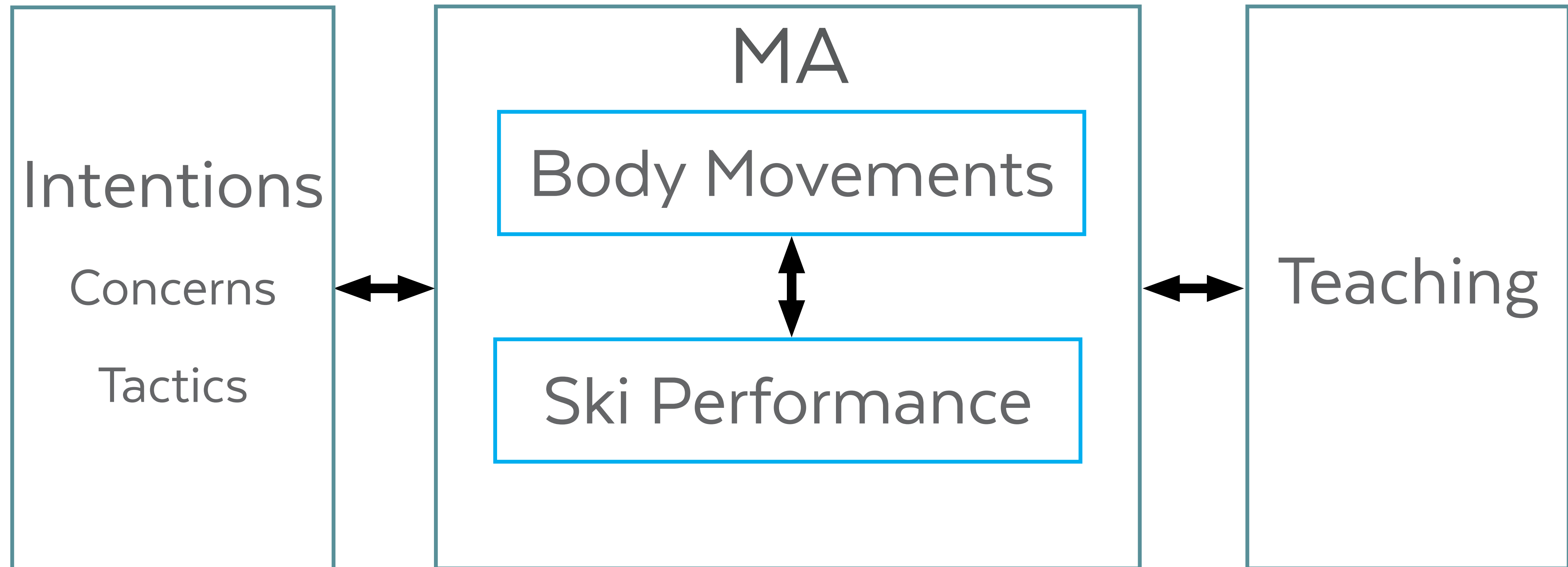
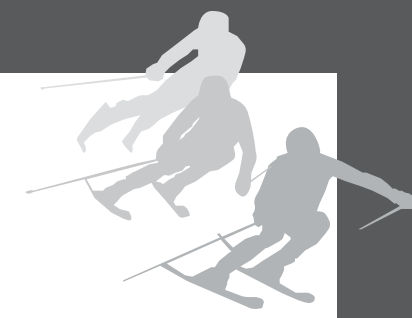
For this turn!



# How Skiing Works

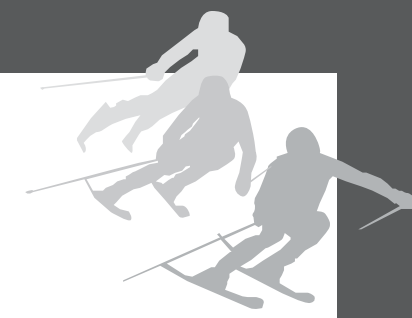


# Movement Analysis as Practiced



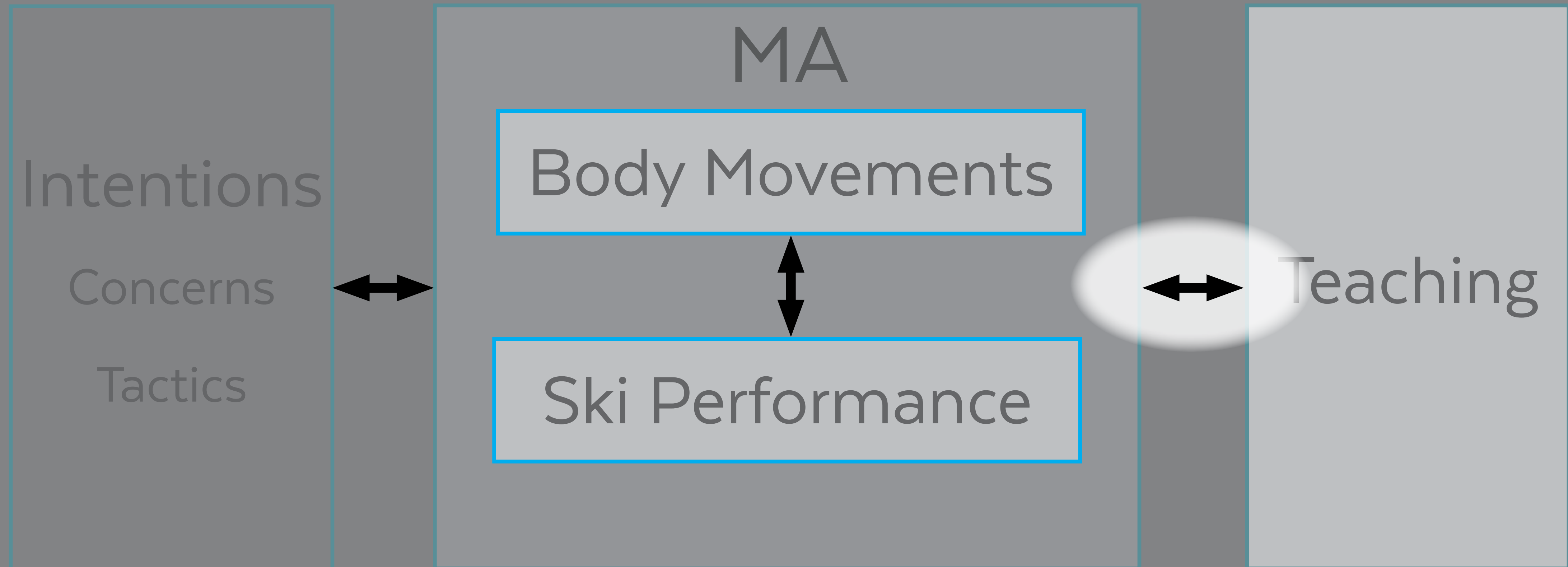


# Prescribing Changes

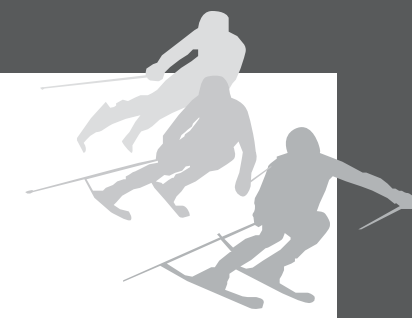


"...and prescribing changes for enhanced efficiency, effectiveness, and performance"

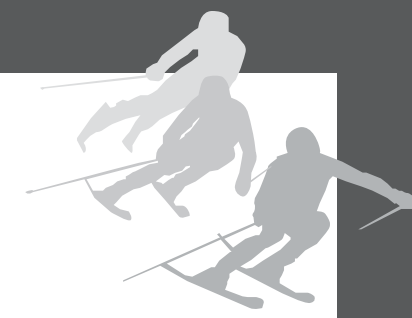
# Prescribing Changes





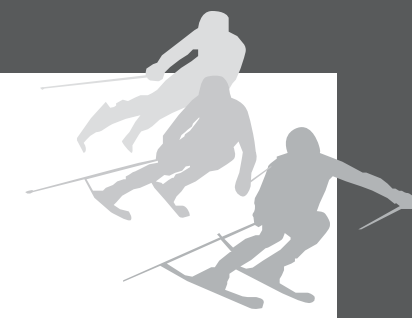


Efficiency, effectiveness, and performance are judged by how well your tactics address your other intentions, and how well you execute your tactics.



So, useful movement analysis of someone's skiing requires an understanding the skier's intentions and tactics.

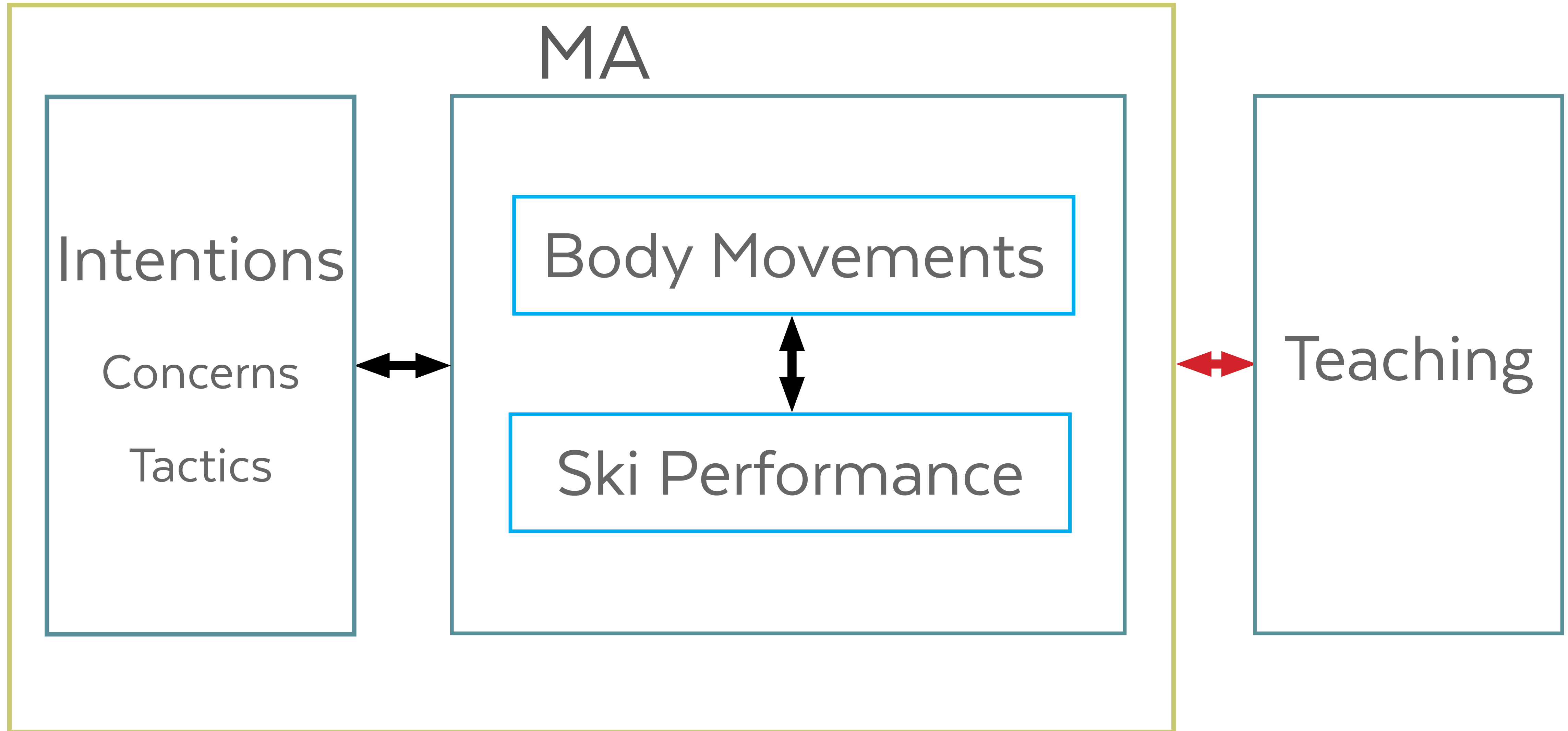




Also, the best prescriptions are often a matter of tactics, not technique.

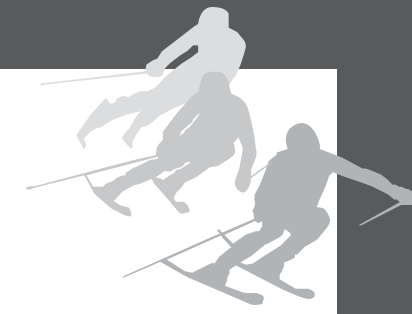
Tactical prescriptions lend themselves to externally focused cues.

# Expand the Context of Movement Analysis





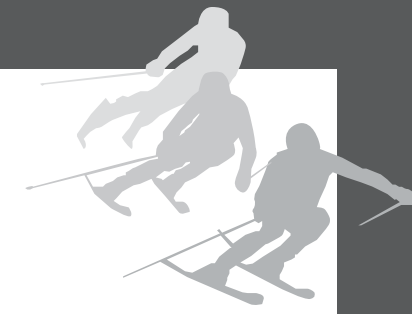
# How to Assess a Skier's Intentions



Remember that you have two ears and one mouth

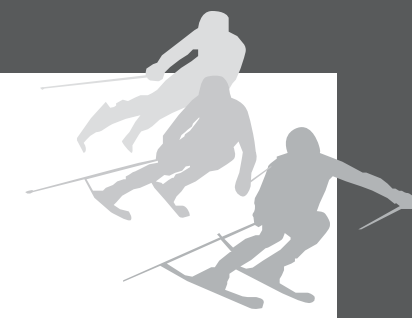
Use them in that ratio

# Teaching: Delivering Prescriptions

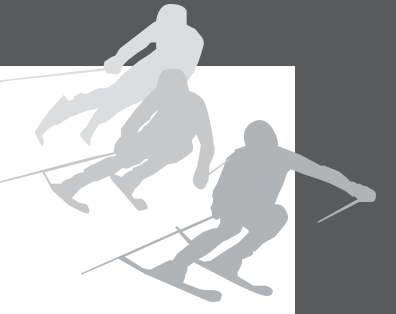


"...and prescribing changes for enhanced efficiency, effectiveness, and performance"





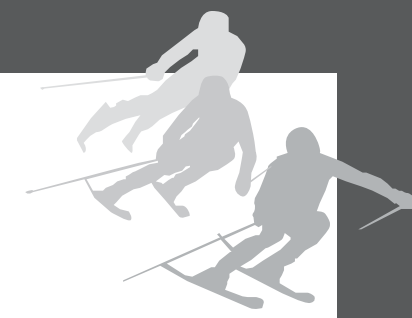
# How We Talk with Students



Instructors often talk to students as if they were other instructors



# Flipping the Switch



How we should talk  
with colleagues

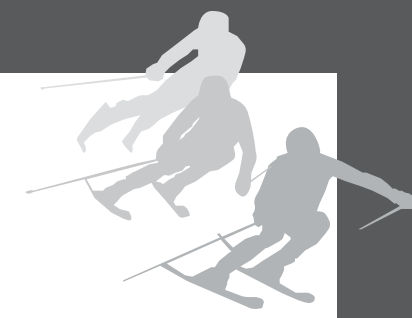
Objectively

Unambiguously

Technically

How we should talk  
when we teach

# Flipping the Switch



How we should talk  
with colleagues

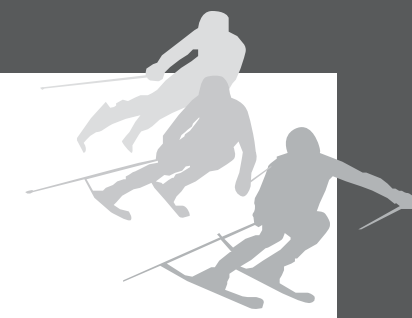
How we should talk  
when we teach

Subjectively

Metaphorically

In their language

# OPTIMAL Theory of Motor Learning\*

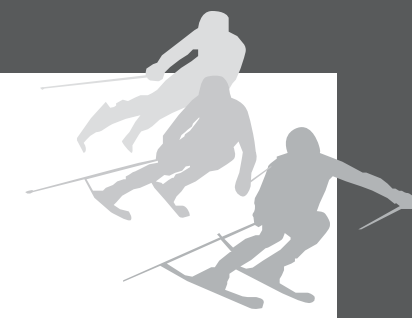


- Enhanced expectancies
- Autonomy
- External focus of attention

\*Wulf, G., Leuthwaite, R. (2016). Optimizing performance through intrinsic motivation and attention for learning: The OPTIMAL theory of motor learning *Psychonomic Bulletin & Review*, 23:1382-1414







TEAM USA

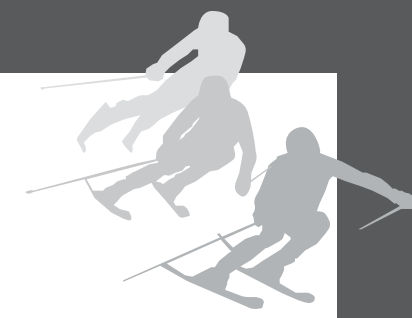
## Coaching Communication Loop

Describe   Demonstrate   Cue   Do   Debrief

This is where external focus is important!!!

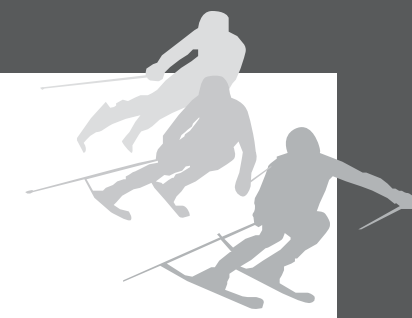
Source: Nadine Dubina, US Olympic & Paralympic Committee, 2020

# Navigating Confined Spaces



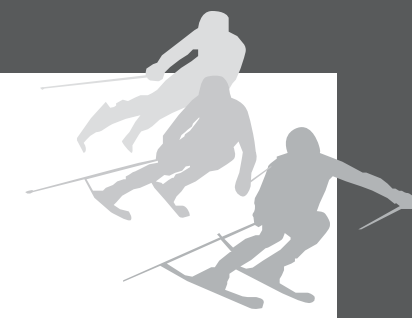
© Ron LeMaster

# Wrapping Up

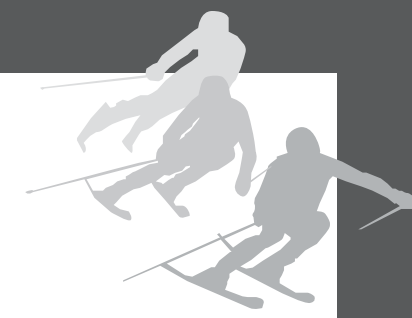


- Movement analysis, as it is currently practiced has two problems
  - It focuses on too narrow a window of the skiing picture to be as useful as it could be
  - The raw results of movement analysis are often used, inappropriately, as teaching material



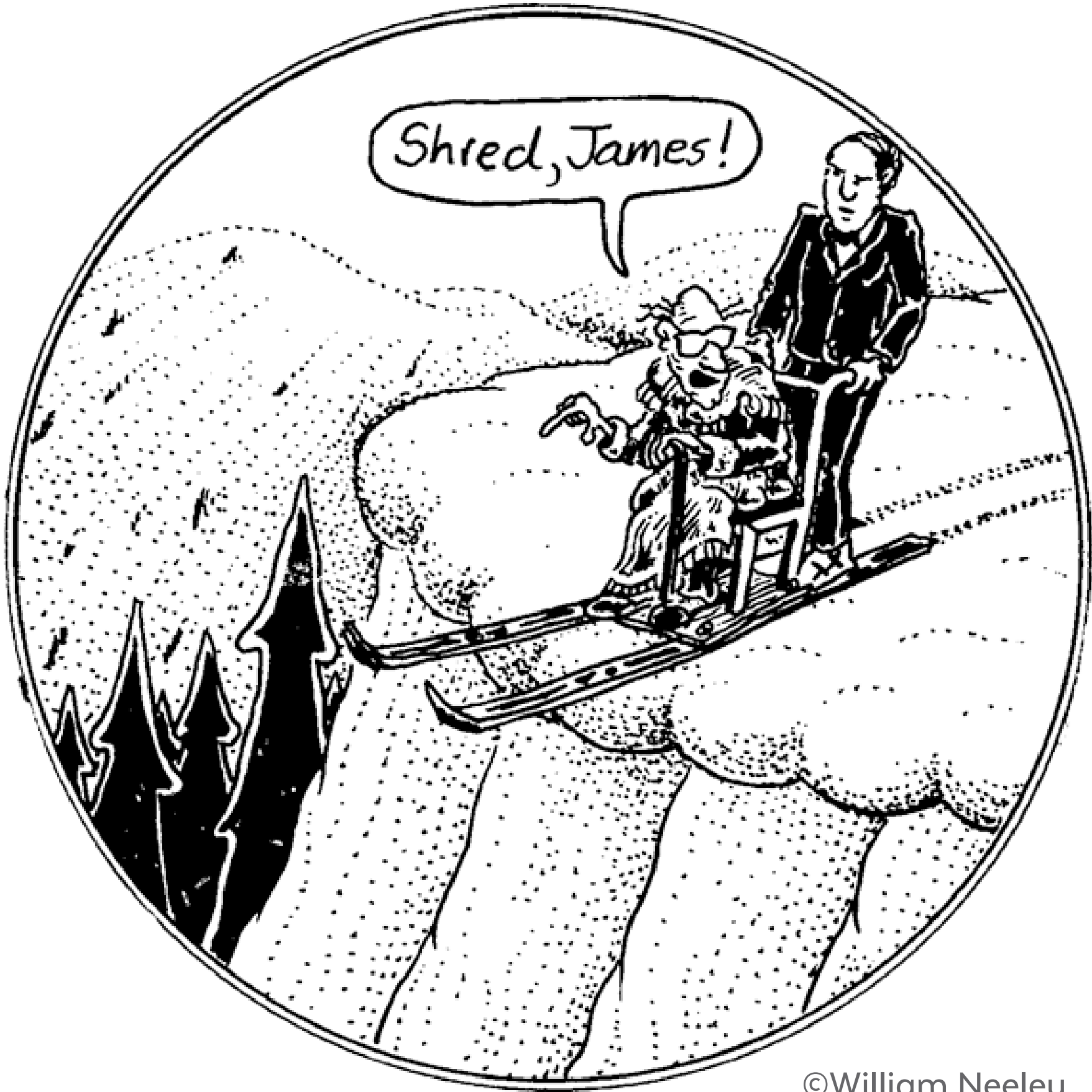
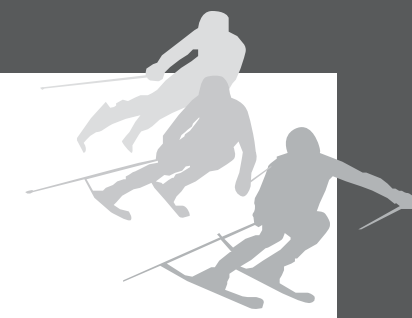


- The domain of movement analysis needs to include evaluation and and prescription of the skier's intentions
  - The skier's interest in controlling speed, direction and stability
  - The tactics the skier employs to achieve that control



- Interactions with the student or athlete should be voiced in the student's vernacular, and driven by evidence based research
  - Avoiding technical jargon
  - Using cues that
  - focus the skier's attention on external elements

# Thank You for Your Time!



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