Whole and Part Practice

KIN 377 Motor Learning - Spring 2024 @ CSUN

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Credits

This presentation is based on the book by Magill & Anderson (2020).

Learning Objectives			
• Define the terms	and	as they rels	ate to the relation-
	or components of a comp		ate to the relation-
1 0 1	apply the part-practice		and
to th	e practice of motor skills.		
• Describe several ways	to apply	_ methods to the pract	tice of motor skills.
Definitions			
• Whole practice			
- A practice strateg	y that involves practicing	a skill	(i.e., as a whole)
• Part practice			
 A practice strateg ticing the whole s 	gy that involves practicing skill	s of	a skill before prac-
Practice a Skill as a Who	ole or in Parts		
The decision to practice a si and character	-		
	characterize a skill.	or components and	d the degree of
$\qquad \qquad \text{mands on } \underline{}$	sks have		and place more de-
- Note: "Complexit	ty" is distinct from "	"	
• Organization: The $_$	among tl	he component parts of	f the skill.
	vel of organization when it interdependent.	ts component parts are	e
* Example:			
 Low level of orga pendent. 	nization: When the comp	ponent parts are	inde-
* Example:	·		

Decisions to Use Whole or Part Practice

• Is the **Complexity** High or Low

Assessing the lev	els of	and	of a skill.	
• If the sk	ill is	in	and	in
	, practice			
			and	in
	, practice	by using the part met	shod.	
See a closer look:	The simplificat	ion method for learnin	ng three-ball juggling in the	next slide.
How to decide	whether to us	se Whole or Part p	ractice?	
• One needs	to	the skill		
		riggs (1963), focus on	:	
		00- (),		
	tent to which th	ue spatial-temporal ch	aracteristics are	
			id best r	
skill	Willell levels of		5050 1	epresent the
Organization v	s. Complexity	approach: beam ro	outine in gymnastics	
_				
_		Low Organization	on High Organization	
	Low Complexi			
1	High Complex	ity		
_				
Organization: Tl	ne	among the compo	onent parts of the skill.	
Complexity:	of	parts or components	and the degree of	that
characterize a sk	ill.		_	
Rule of thumb				
• If High in	Organization ->	one must use	because the pa	rts are inter-
_	else, either appr		•	
• If High in (Complexity -> o	ne must use	because the parts	are intercon-
nected; else	e, either approac	h is ok.		
• How would	vou practice a	balance beam routine	in gymnastics?	
	anization High		S.J	

• Answer:	$_{-\!-\!-\!-\!-\!-\!-\!-}$ and $_{-\!-\!-\!-}$	>	>	is the most effec-
tive				
Organization	vs. Complexity approa	nch: Baseball p	itching	
	La	ow Organization	High Organization	_ n
	Low Complexity High Complexity			
Organization:	Γhe am	ong the compone	ent parts of the skil	1.
Complexity:characterize a s	of parts o	r components and	the degree of	that
Rule of thumb				
_	Organization -> one m l; else, either approach is		because th	ne parts are inter-
_	Complexity -> one must se, either approach is ok.	5 use	because the p	oarts are intercon-
• Is the Or	ld you practice baseball p ganization High or Low mplexity High or Low	_		
	and		>	is the most effec-
Part practice:	Fractionization			
• Definition (AC).	: Fractionization is a part	z-practice strateg	y for skills requiring	·
- Wha	t is AC?			
	Tasks that demandsimultaneously.	move	ements from each lin	mb (arm or hand)
• Does it m	atter which limb to prac-	tice first?		
- The tice.	of indi-	vidual limb move	ements determines	the order of prac-
*	Sherwood (1994) suggests	s starting with th	ie more	limb.
• Controver	rsy in Research			

- Mixed evidence on the efficacy of whole versus part-practice approaches.
- Fractionization is supported as an effective strategy for asymmetric skills (Walter & Swinnen, 1994).

Examples	
Musical instruments like the	or sports skills like the
Segmentation - Intro	
• Method	
parts, culminating in the whole	skill. move from to,
• Overcoming Integration Challenges	
learned in isolation.	trying to separate parts of a skill practice reinforces the connection between parts
• Allows on individua	al parts, easing the cognitive load.
Mitigates difficulties in	
• Ideal for skills involving	of movements.
 Combines the attentional benefits of p of whole practice. The learner progressively masters 	coordination as parts are integrated. part practice with the advantages the coordination of parts while managing the
of the whole skill.	
Segmentation - Examples	
• The breaststroke	
- It can be divided into	and
	efore integrating them, focusing on

• Empirical Support for Segmentation	
 Watters (1992): Demonstrated benefits for Ash and Holding (1990): Showed advantages for learn 	
Simplification - Intro	
 Definition: Simplification involves a skill easier to perform. Aimed at helping learners grasp skills by Strategies: Several methods can be used, each tailored skills. 	v reducing difficulty.
1. Reducing Object Difficulty	
 Technique: Use objects to reduce task control. Example: Learning to juggle with instement. Research Support: Early practice with simpler objects. (Hautala, 1988). 	ead of balls to slow the move-
2. Reducing Attention Demands	
 Strategy: Minimize the by reducing the Example: Using while learning to slalom coordination (Wulf et al., 1998; Wulf & Toole, 1999). Application: Body-weight support systems in gait rehable load of (Miller, Quinn, & Seddon, 2002). 	improves focus on movement
3. Reducing Speed	
 Purpose: practice to emphasize the tin skill. Benefit: Establishes essential patterns the mal speeds. 	
• Evidence: Effective for learning both and Swinnen, 1992).	d (Walter &

4.	1. Adding Auditory Cues	
5.	5. Sequencing Skill Progressions	
	• Example: Baseball players progressing from pitched ball.	e complexity of tasks in a sequenced manner. om hitting off a to hitting a and increased et al., 2012).
6.	5. Simulators and Virtual Reality	
	over specific conditions. • Examples: Diverse applications across and training.	consequences and offers control ,,,
0	Other Approaches	
A	An Attention Approach to Part Practice i	n Whole Practice
	• Premise: It's possible to focus on improve specific aspects.	of a skill during whole practice to
	1 1	and practice
\mathbf{T}	Theoretical Support for the Attention A_{Γ}	proach
	• Attention Theory: Kahneman's model high	alights ' ' as

• Application: Directing attention to a _____ part of a skill during its perfor-

a key to allocating attention.

mance.

Empirical Evidence of Attention-Directing Strategy

• Study: Gopher, Weil, and Siegel (1989) on learning the		
• Findings: Directing attention to specific	of the game improved mastery.	
Implementation of Attention-Directing Strategy		
 Instructions focused on specific skill components, or mines. The dual-strategy group (controlling spaceship first, 		
other groups.	·	
Teaching Implications		
 Before deciding whether to practice a skill as a whoskill to identify its component parts. After analyzing a skill and identifying its parts, performance of any one part or part. When parts are characterized with this relaticed rather than as separate part. It is important not to assume that because parts of the practiced separately; the performance dependent should always the decision concrately and which parts to practice together. When the parts of a skill follow a specific way to engage in part practice is the are practiced in sequence and become increasingly. 	determine the degree to which the n the performance of the preceding ationship, the parts should be practs. can be, they should nce on preceding and following parts terning which parts to practice sepa of movements, the preferred part method, in which parts	
 when practicing the parts of a skill is not advisable or possible, consider ways to the whole skill before engaging people in performing the skill as it would be performed in its real-world context. When the technology is available, and		
provide excellent initial means of engaging people them practice it as it would be performed in its rea • Directing attention to a part of a skill while perform way to errors for parts of a skill that parts.	al-world context. ning the whole skill can be an effective	

References

 $\label{eq:magill} \begin{tabular}{ll} Magill, R. A., \& Anderson, D. (2020). $Motor learning and control: concepts and applications. McGraw-Hill Education. $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-and-control--concepts-and-applications-147614-1 $https://www.bkstr.com/csunorthridgestore/product/motor-learning-applications-a$