



Institute for the Psychology of Elite  
Performance (IPEP)

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Elite Performance (IPEP) is housed  
within the School of Sport, Health  
and Exercise Sciences, Bangor  
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2000 and its mission is to develop  
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<http://ipep.bangor.ac.uk/>

**Performance pressure is like  
‘chocolate’; some people can  
devour as much as they want  
without any negatives whilst  
others suffer at the mere  
mention of the word**



**Performance pressure is like ‘chocolate’; some people can devour as much as they want without any negatives whilst others suffer at the mere mention of the word**



## **Overview:**

Brief background of explanations surrounding ‘choking’ : why people fail under pressure?

Recent practice technique for maintaining performance under pressure.  
Careful considerations of this technique in light of research findings from School of Sport, Health and Exercise Sciences, Bangor University.



**Performance pressure is like 'chocolate'; some people can devour as much as they want without any negatives whilst others suffer at the mere mention of the word**

Choking: failure to perform to one's normal ability as a result of state anxiety.

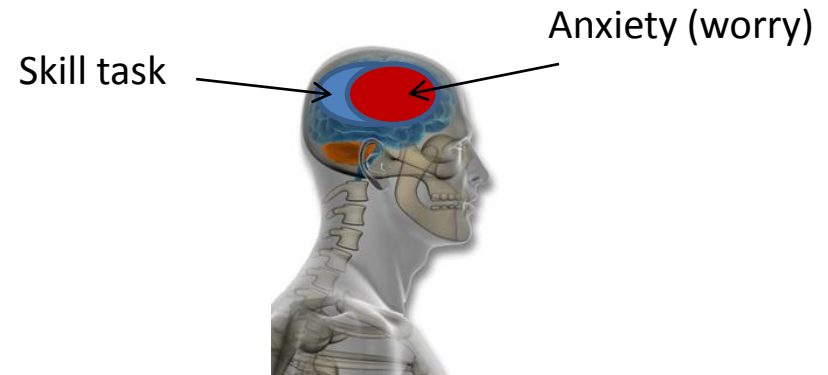
## SELF FOCUS

(Baumeister, 1984; Masters, 1992)

Paralysis by analysis

## DISTRACTION

(Wine, 1971; Eysenck et al., 2007)



**How might we prevent choking?**

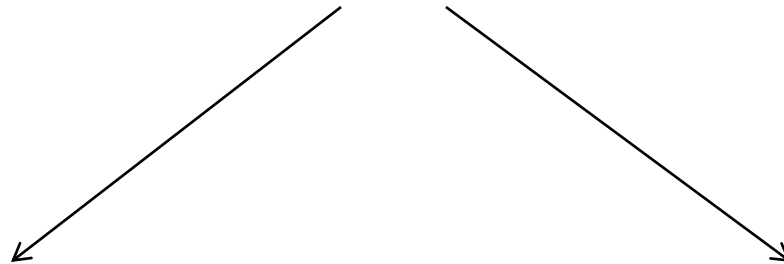
One thought that has received surprisingly little attention is *how practicing with anxiety could minimize the likelihood for choking?*

# SPECIFICITY: PRACTICE & MOOD

(Henry 1968; Proteau, 1992)

(Gillian & Bower, 1983)

Best learning experiences are those that most closely approximate the movements of the target skill and the environmental conditions of the target context (i.e., specificity of practice).



**Sensory information** (Proteau, 1992;  
Khan & Franks, 2000; Mackrouts & Proteau, 2007)



**Mood state** (Gillian & Bower, 1983)

Specificity  
effect is  
increased as a  
function of  
practice



# TRAINING UNDER ANXIETY

(Oudejans and colleagues, 2008; 2009; 2010)



Training with anxiety reduces choking (hand gun shooting).

Purpose:

Whether these positive effects are dependent on the amount of exposure to anxiety and the timing of that exposure in relation to where in learning the exposure occurs.

Specificity – 1. the more exposure the greater the benefits

- 2. the earlier in learning exposure occurs the greater the benefits



# EXPERIMENT 1



Practice under either:

Anxiety throughout practice

anxiety either in the early or late stages of  
acquisition

or without anxiety (i.e., control condition)

Transferred to an anxiety condition

**Pressure training should result in greater congruity between learning and pressure test and thus increase high pressured performance.**

# EXPERIMENT 1



Practice under either:

Anxiety throughout practice

anxiety either in the early or late stages of  
acquisition

or without anxiety (i.e., control condition)

Transferred to an anxiety condition

Pressure training should result in greater congruity between learning and pressure test and thus increase high pressured performance.

Also, if specificity is dependent on the amount of exposure during training, then anxiety throughout practice will lead to greater performance robustness under subsequent pressure tests.

# EXPERIMENT 1



Practice under either:

Anxiety throughout practice

anxiety either in the early or late stages of  
acquisition

or without anxiety (i.e., control condition)

Transferred to an anxiety condition

(SPECIFICITY) Hypothesized: anxiety condition should result in greater congruity between learning and transfer and thus increase transfer performance.

Also, if specificity is dependent on the amount of exposure during training, then anxiety throughout practice will lead to greater performance robustness under subsequent pressure tests.

**(WHEN TO INTRODUCE ANXIETY)** benefits greater for those exposed to it from the start of learning; developing a strong and robust semantic network early in the learning process.



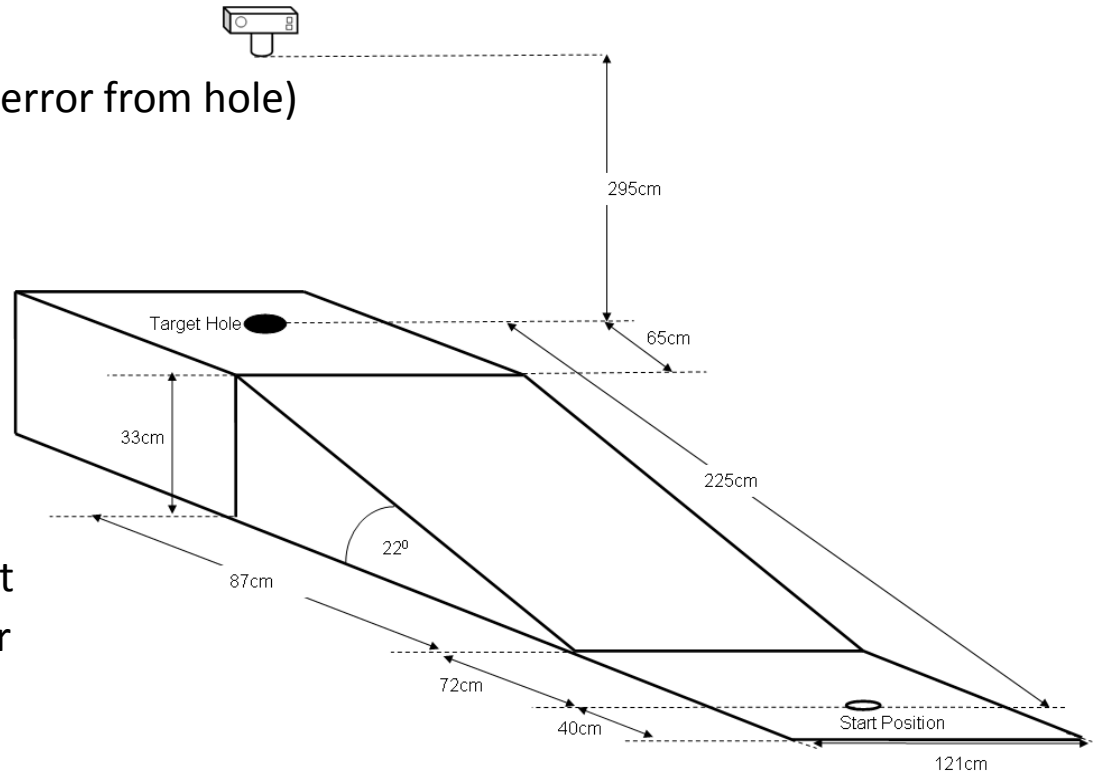


# EXPERIMENT 1

- **Participants:** (12 women, 20 men) mean age 20.2 years
- **Task and apparatus:**  
 Putt as accurately as possible  
 (number of successful putts and error from hole)  
 Training 300 putts  
 Transfer to pressure 25 putts

## *Pressure*

Training: £.10 removed for each missed putt  
 Transfer: increase performance 15% (eligible to win £30; greatest improvement wins cash). Partner





# EXPERIMENT 1

- **Pressure or worry about performance**

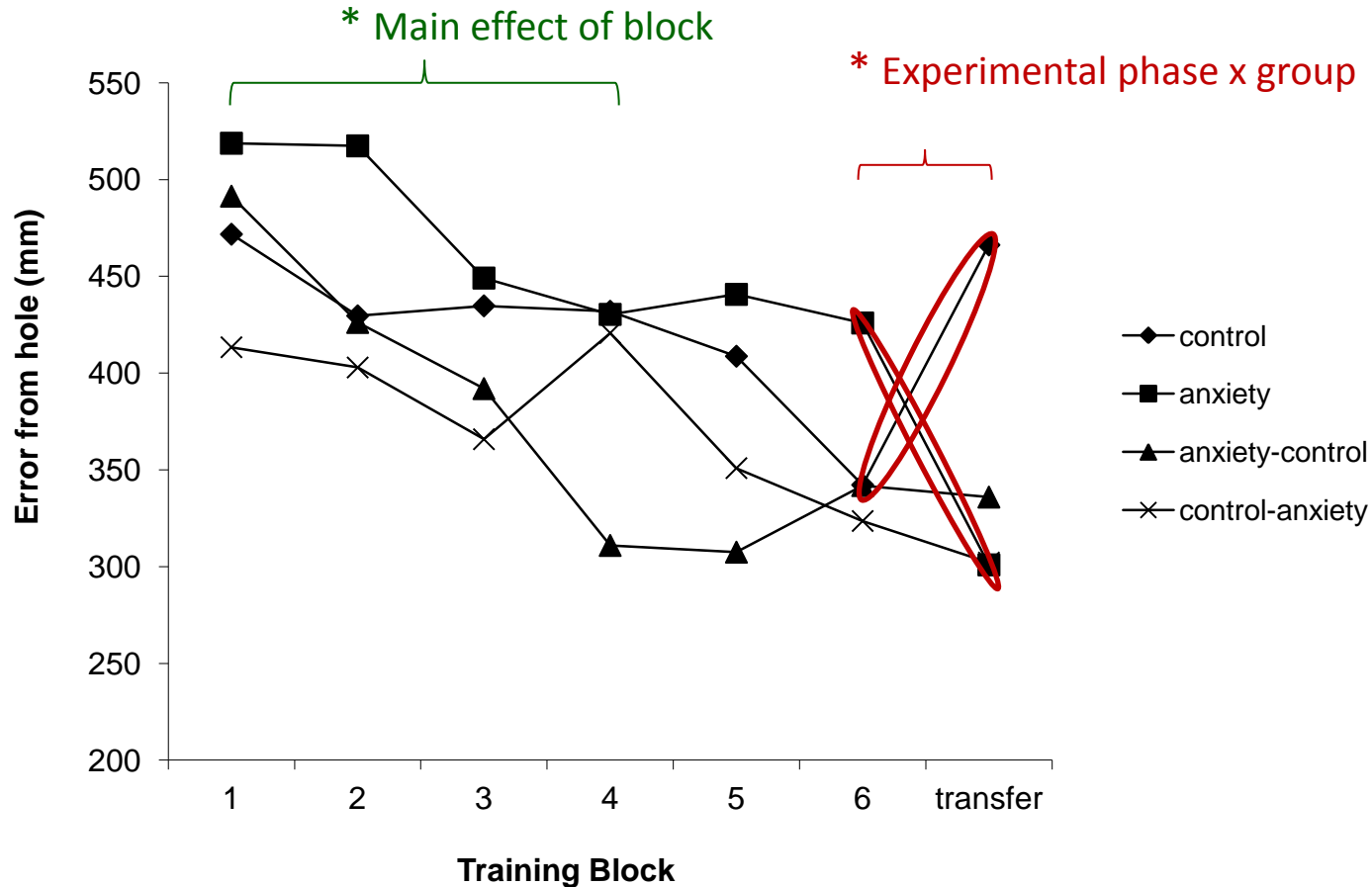
Group	Time		
	Pre	Mid	Transfer
Control (low pressure)	2.50 (1.20)	2.00 (0.54)	<b>6.00 (1.31)*</b>
Anxiety (high pressure)	5.25 (1.28)	5.88 (1.25)	5.75 (1.75)
Anxiety-control	5.75 (1.04)	<b>2.50 (0.92)*</b>	<b>6.00 (0.93)*</b>
Control-anxiety	2.50 (0.93)	<b>5.87 (1.13)*</b>	7.00 (0.92)

\* signifies a significant within subject change in pressure from the previous time point.

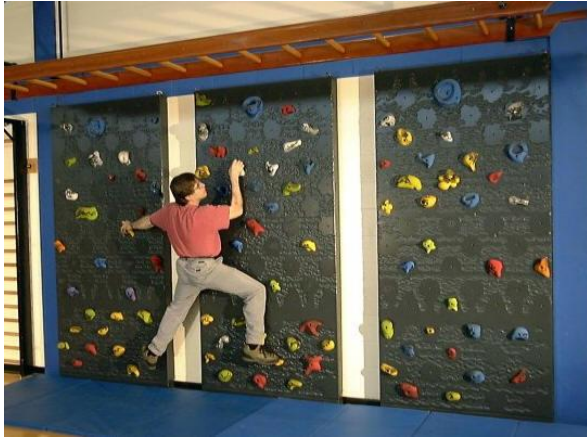


# EXPERIMENT 1

- Performance**



# EXPERIMENT 2



Identical groups

Practice under either:

Anxiety throughout practice

Anxiety early

Anxiety late

Without anxiety (i.e., control condition)

Transferred to an anxiety condition

**+ Transferred to an low anxiety condition**

**Purpose** was twofold:

(1) to investigate when learning with anxiety is most appropriate for a complex task

(2) to further investigate the principles of specificity



# EXPERIMENT 2

- **Participants:** 32 novices (4 women, 28 men) mean age 26.4 years

- **Task and apparatus:**

5.5m (easy 4a/V0) Climbing Traverse (mean hold height 1.25m [SD .46m])

Videod (viewed by two independent assessors)

### *Performance*

(Traverse time & NOPM, *NOEM*, *NOVM* (*uncertain movements*))

Acquisition 100 climbs (10 blocks of 10 over 2 days)

Anxiety Transfer (10 trials)

Low anxiety Transfer (10 trials)

### *Pressure*

Training: videoed for analysis, leader board, best performer win activity day

Transfer: increase performance 15% (greatest improvement win activity day)

*Effort* (1-10 likert scale)





# EXPERIMENT 2

## Pressure:

Group	Time			
	Pre	Mid	Transfer1	Transfer 2
Control	2.00 (.50)	2.00 (.51)	<b>10.00 (.5)*</b>	<b>2.25 (1.26)*</b>
Anxiety	9.75 (.50)	8.25 (.50)	9.75 (.52)	<b>3.75 (.50)*</b>
Anxiety-control	8.75 (.96)	<b>2.00 (.81)*</b>	<b>10.00 (.75)*</b>	<b>2.50 (.58)*</b>
Control-anxiety	1.00 (.82)	<b>9.75 (.50)*</b>	8.75 (1.25)	<b>2.75 (.96) *</b>

## Effort:

\* signifies a significant within subject change in anxiety from the previous time point .

Group	Time			
	Mid	End	Transfer1	Transfer 2
Control	8.00 (.81)	8.50 (.58)	8.00 (.00)	8.00 (.82)
Anxiety	8.00 (.82)	7.50 (.60)	8.00 (.82)	7.25 (.50)
Anxiety-control	8.00 (1.15)	8.00 (.00)	8.50 (.58)	7.75 (.50)
Control-anxiety	8.00 (.82)	8.00 (.81)	8.25 (.50)	8.25 (.96)

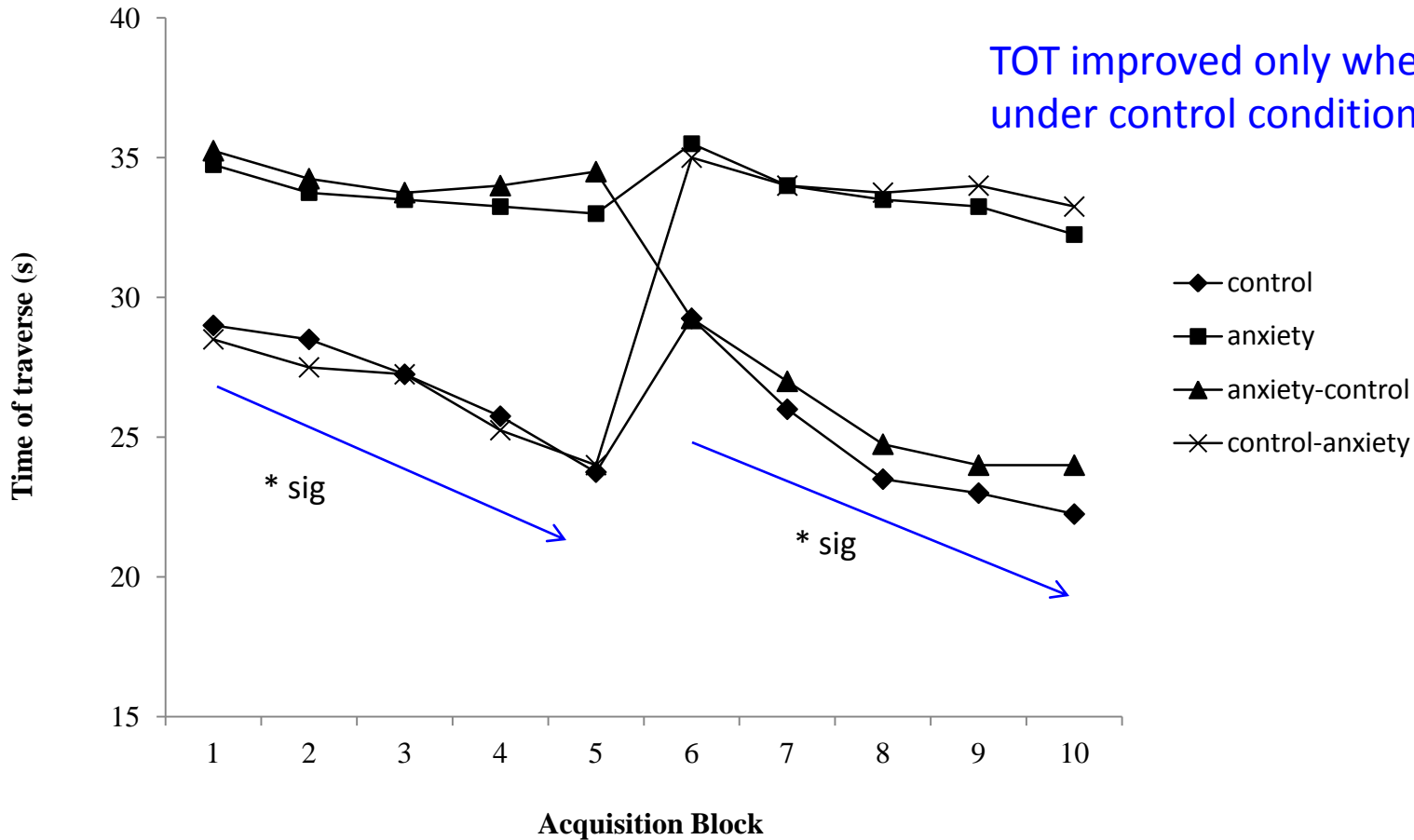


# EXPERIMENT 2

## Training:

Time of traverse significant group  $\times$  block interaction.

TOT improved only when climbing under control conditions

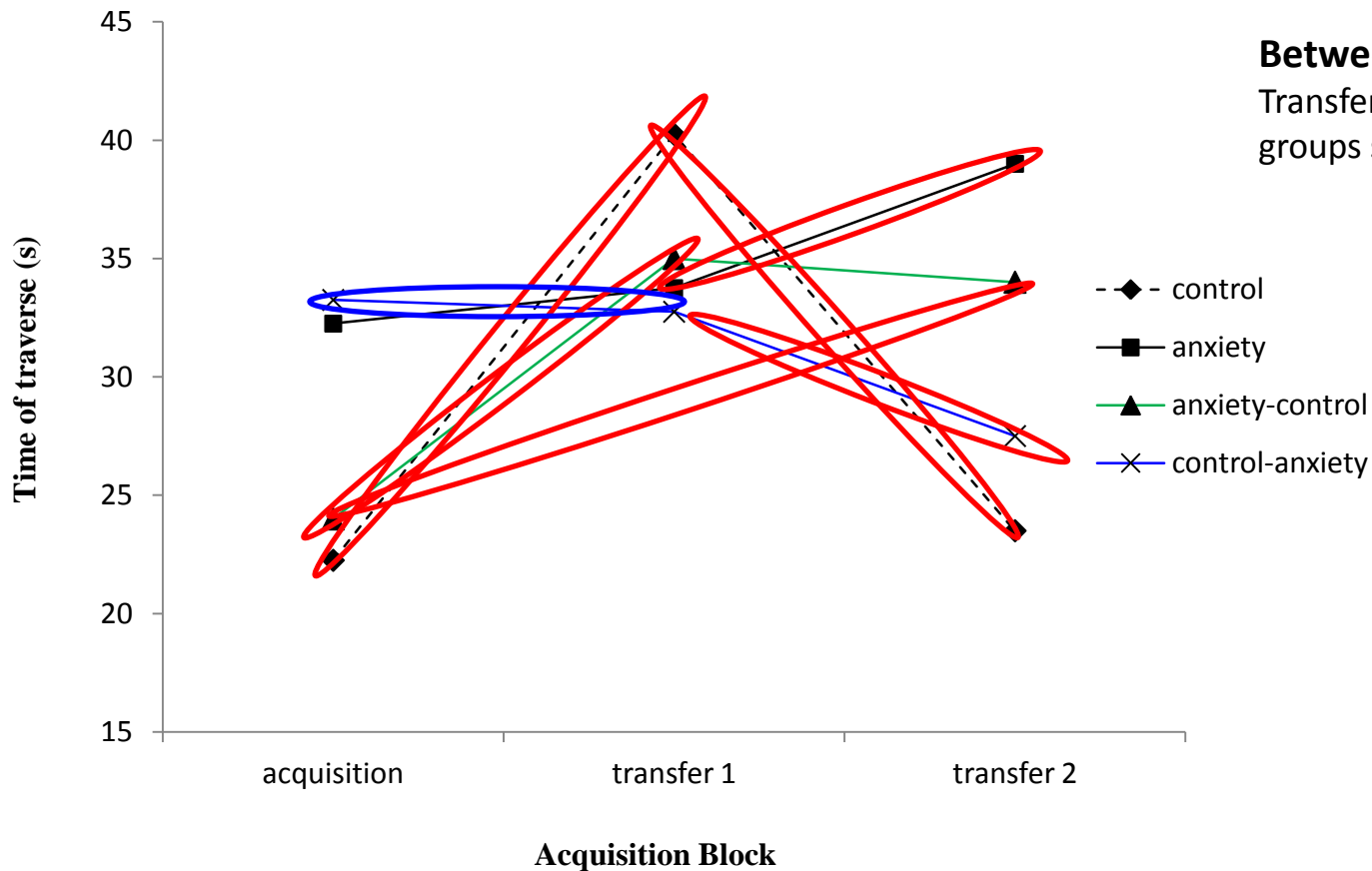




# EXPERIMENT 2

## Acquisition vs Transfer:

**Time of traverse;** significant group  $\times$  block interaction



# EXPERIMENT 2

- **Conclusions**

- Pressure tests; practice with anxiety prevents choking (Exp 1 and Exp 2)
- Pressure tests; practice with anxiety from start of learning leads to poorer performance than anxiety later (complex task)
- No pressure tests; practice only with anxiety resulted in performance decrements (specificity support)!
- No pressure tests; practice with anxiety early in learning leads to poorer performance than anxiety late in learning.

- **General**

- Practice with anxiety beneficial for preventing choking
- BUT will lead to performance failures in non pressure tests!
- Practice with anxiety later in learning better for both subsequent anxiety and control conditions in complex tasks



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**THANK YOU FOR LISTENING**  
**Questions??**

