

Running Dogma: How Runners' Injury Beliefs Can Impact Recovery and How to Educate Them Properly

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GLATA 2023

Conflicts of Interest

No financial conflicts of interest to report

Much of the running-related research presented today is my own. Evaluation and treatment recommendations are primarily based on my own research.



dog·ma

/'dôgmə/

noun

a principle or set of principles laid down by an authority as incontrovertibly true.
"the rejection of political dogma"

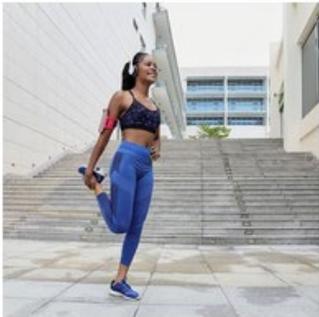
RUNNER'S WORLD

HEALTH & INJURIES



Everything You Need to Build a Strong Core

BY AMANDA BROOKS



Could You be a Quad-Dominant Runner?

BY CASSIE SHORTSLEEVE



How to Prevent Running Injuries

BY MICHELLE HAMILTON

[Health & Fitness / Exercise](#)

10 best women's running shoes, according to experts

By Ashley Mateo, CNN Underscored

Updated 5:34 PM EST, Wed February 15, 2023



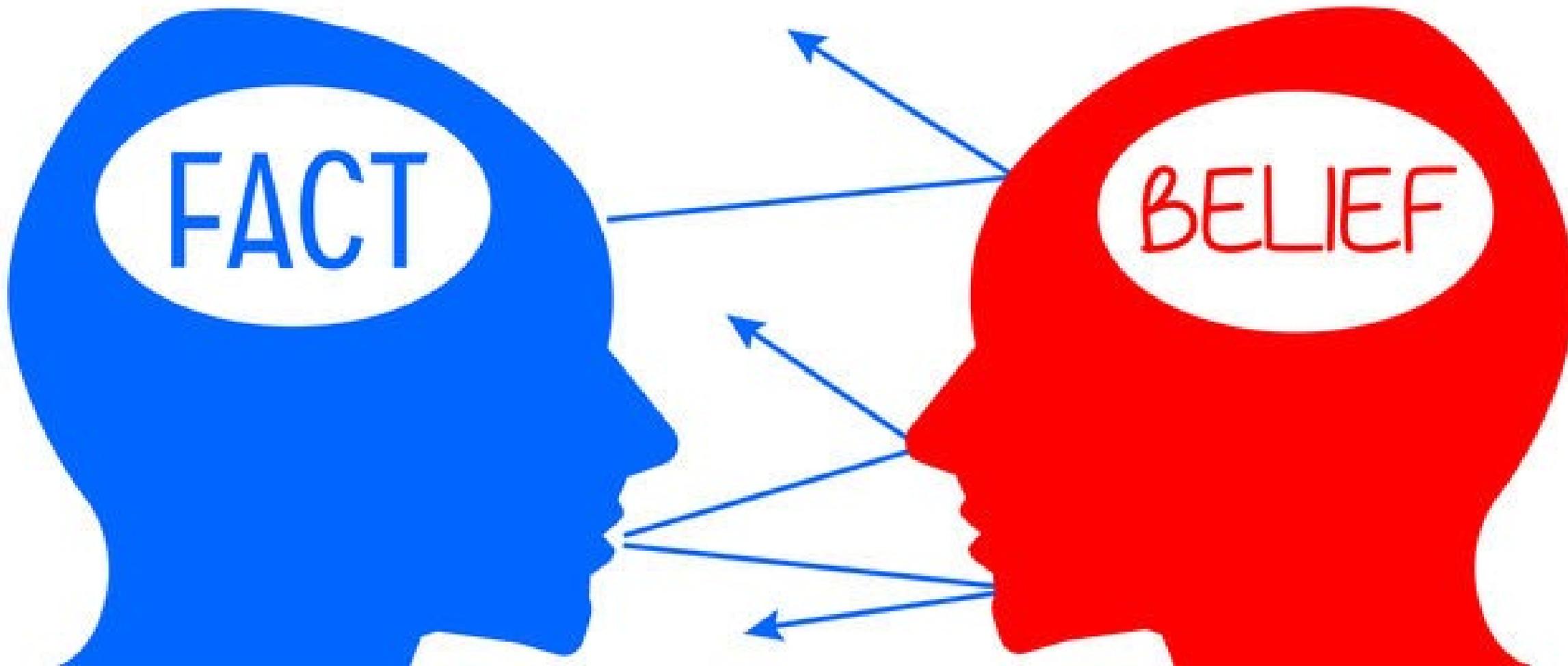
[Fitness & Exercise](#) ▶ [Guide](#)

10 Common Running Injuries: Prevention and Treatment

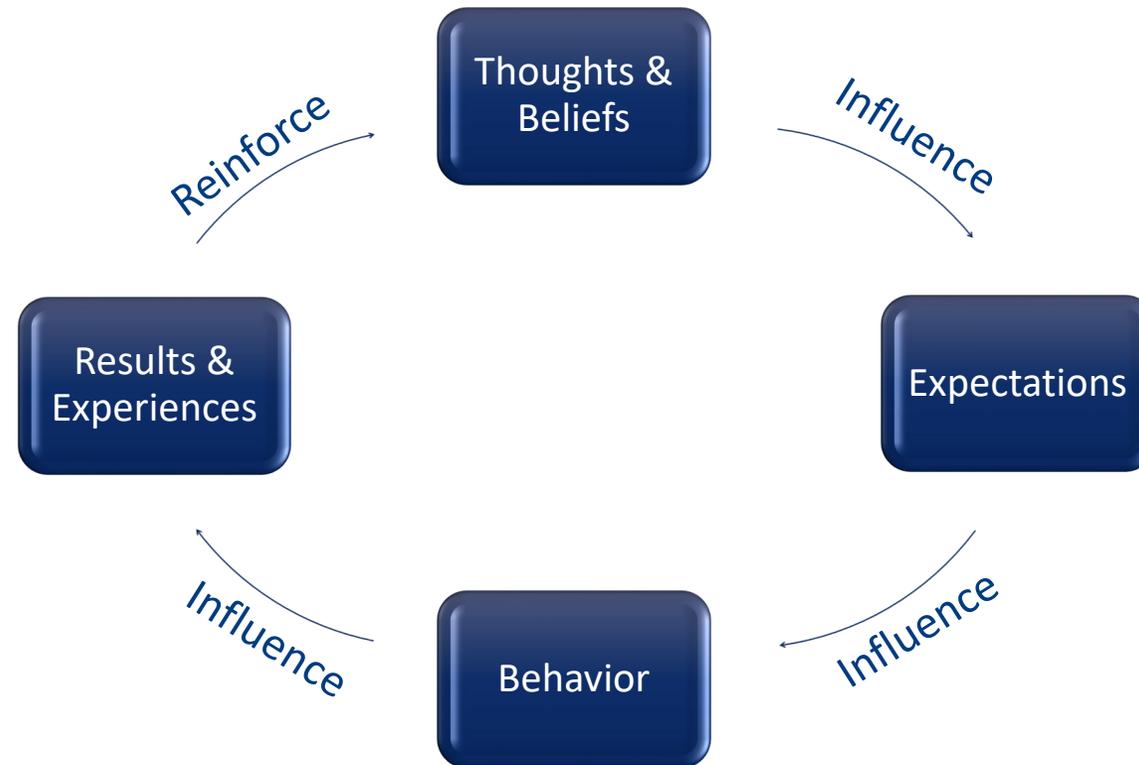
Written by [Hedy Marks](#)

Reviewed by [Sabrina Felson, MD](#) on June 09, 2022

THE
10%
RULE
OF
RUNNING



Beliefs Impact Behavior





Beliefs Impact Behavior

Results: Wear that shoe for training sessions

Behavior: Purchase shoe that “reduces injury”

Emotions: Fear of inability to run, excitement of new shoes

Thinking: If I get the “right” shoe, then I can keep running

Value: Ability to continue running

Belief: Footwear is important

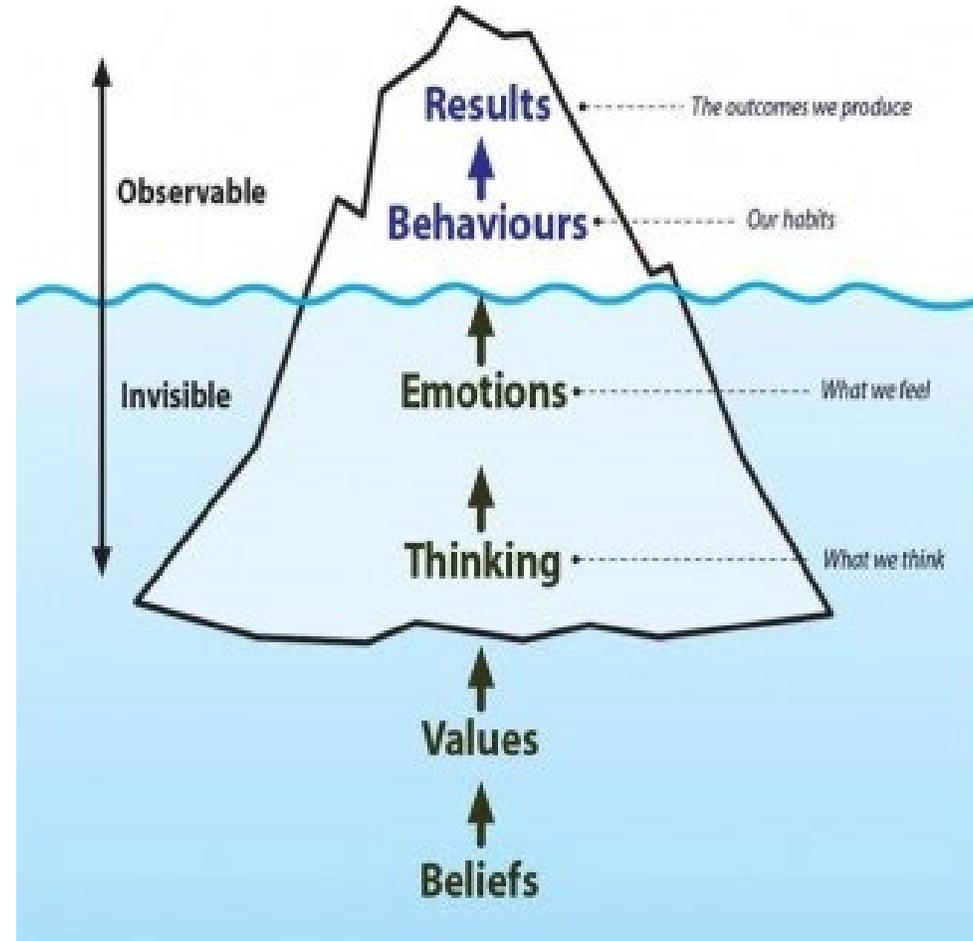
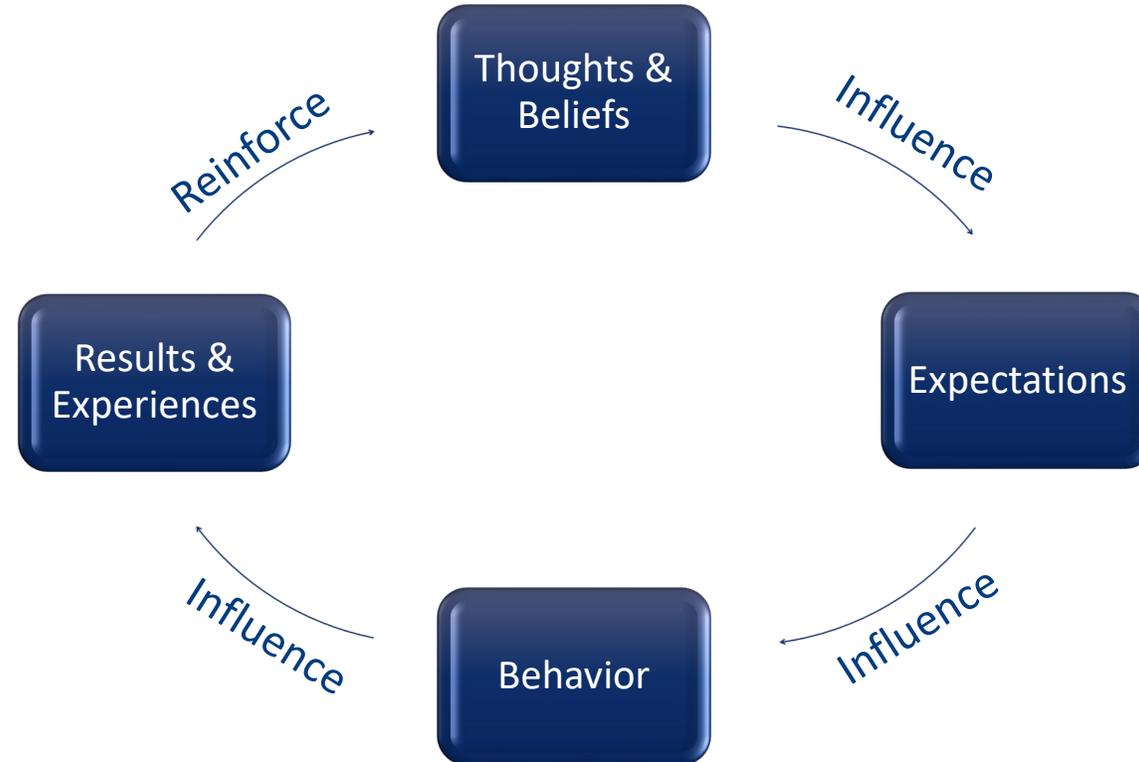
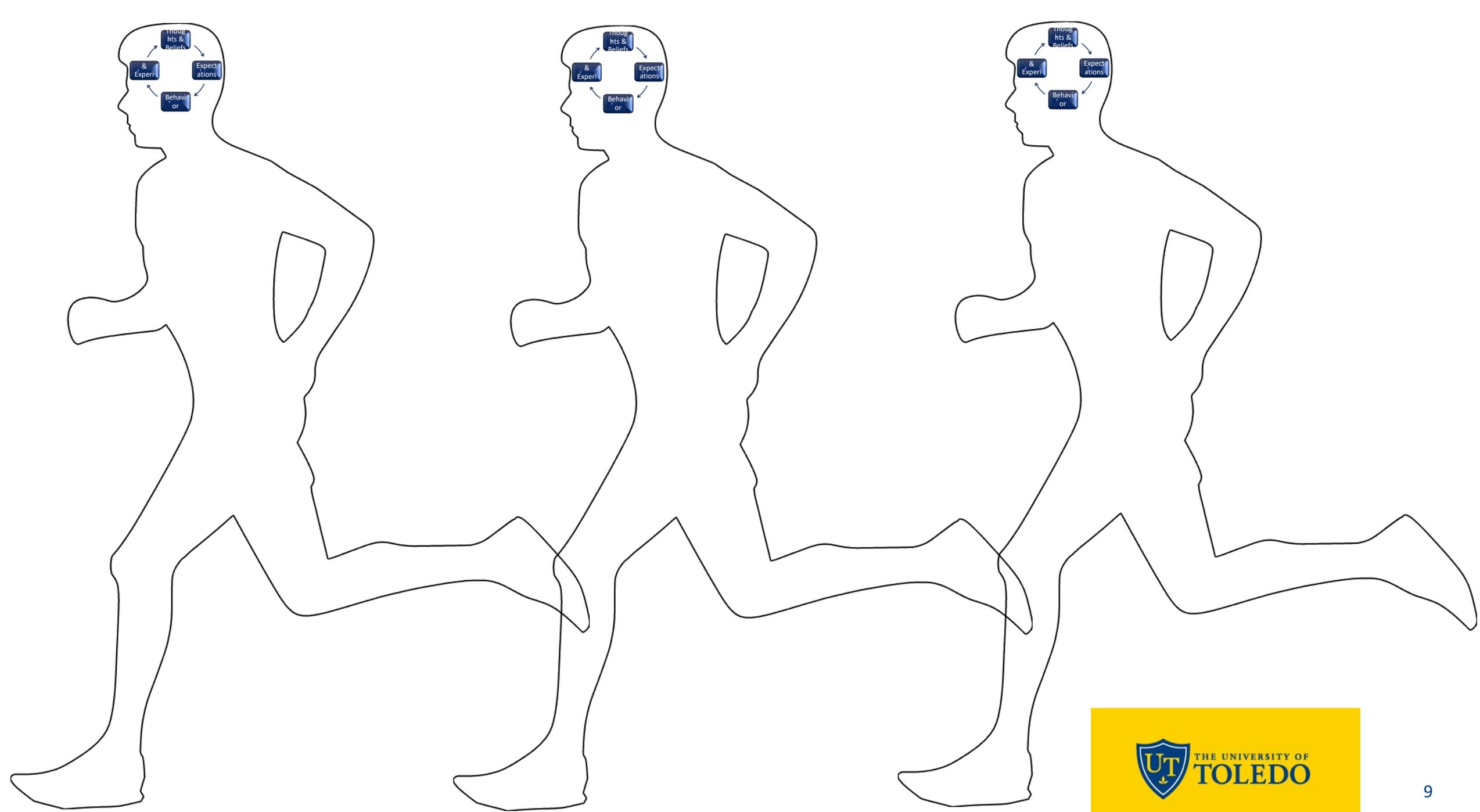


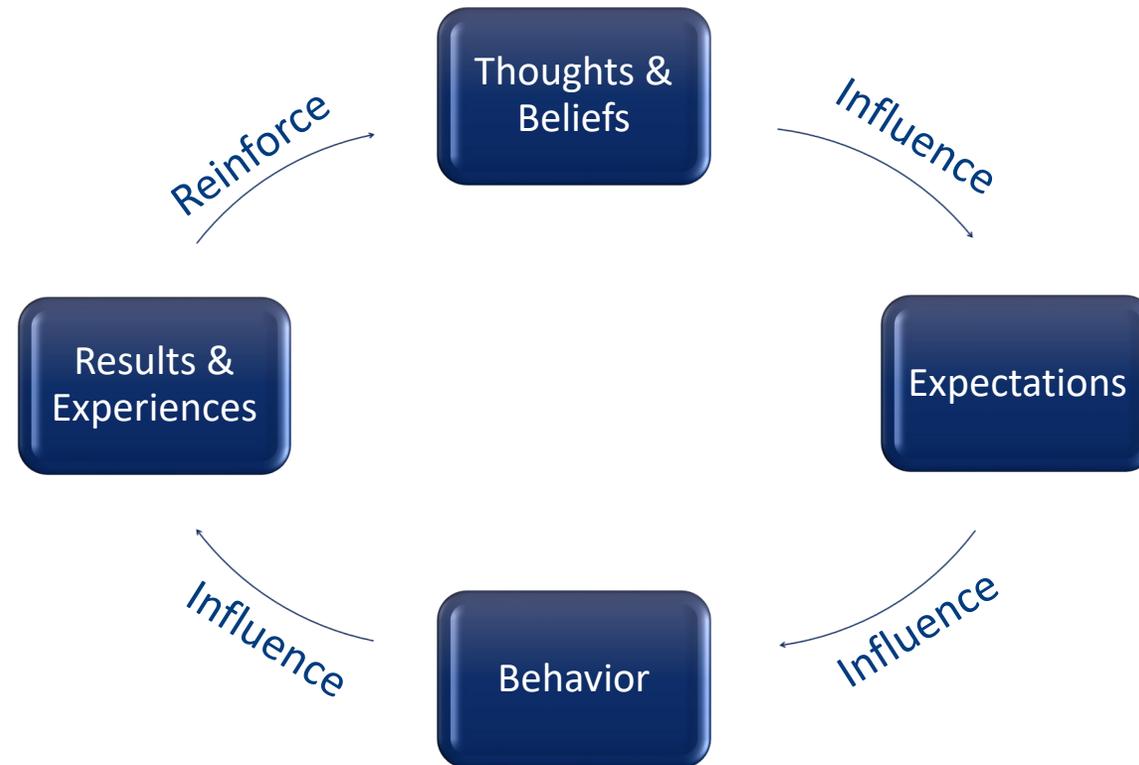
Image from Gai Foskett: <https://www.coaching.net.nz/how-not-to-act-insanely/>

Beliefs Impact Behavior

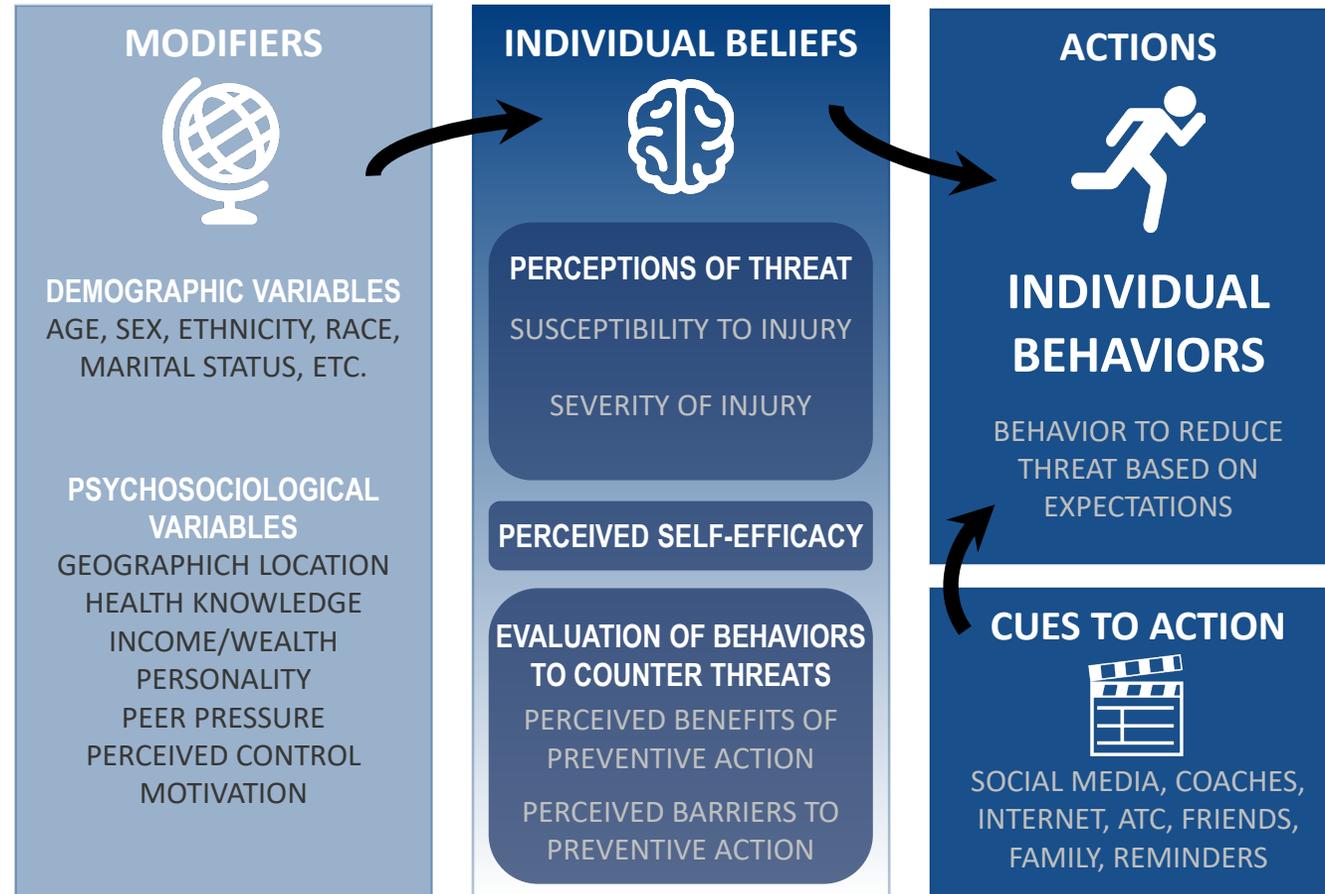




OTHERS' BELIEFS, EXPECTATIONS, & ACTIONS Impact MY Behavior



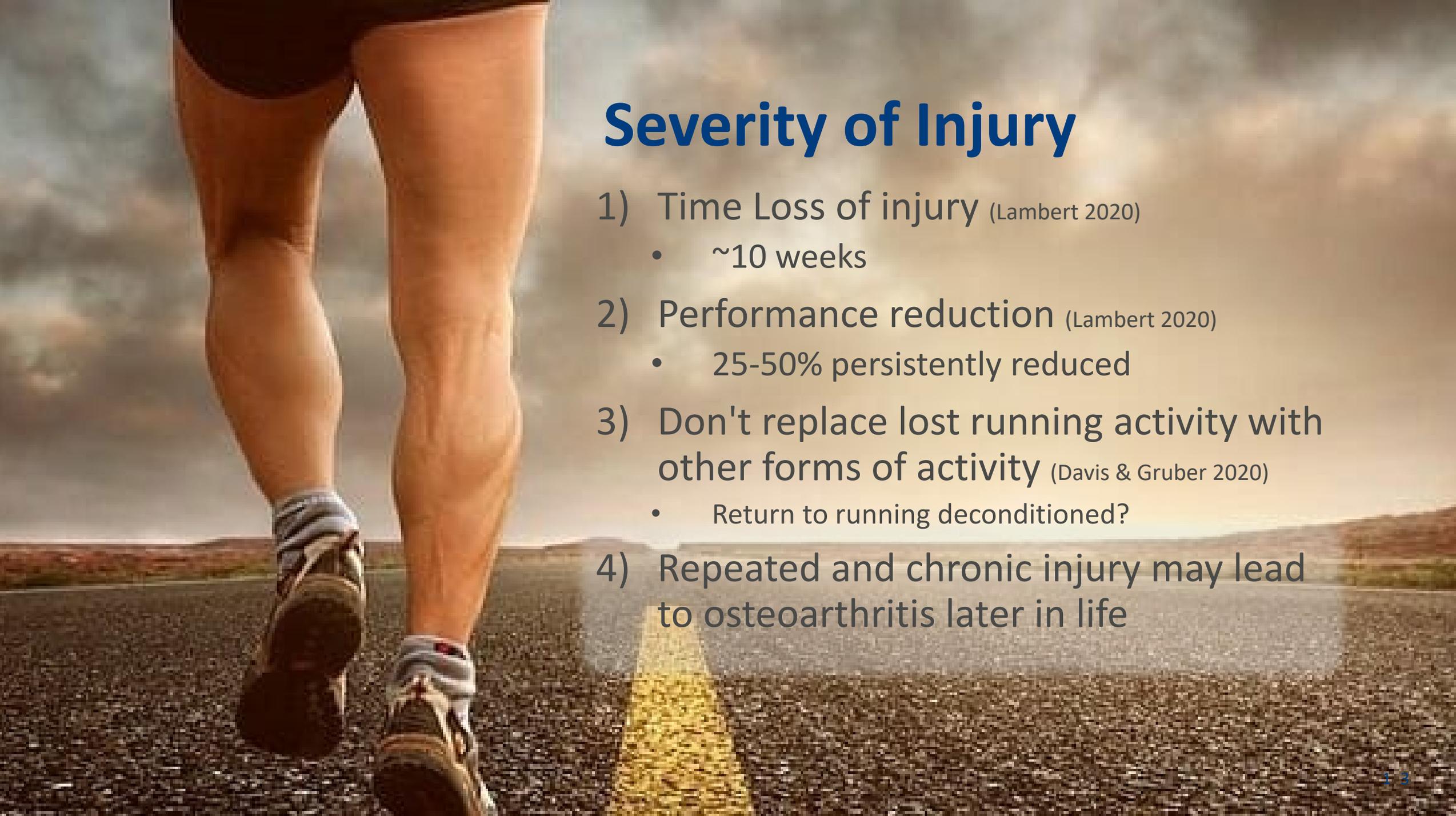
Health Beliefs Model





Susceptibility to Injury

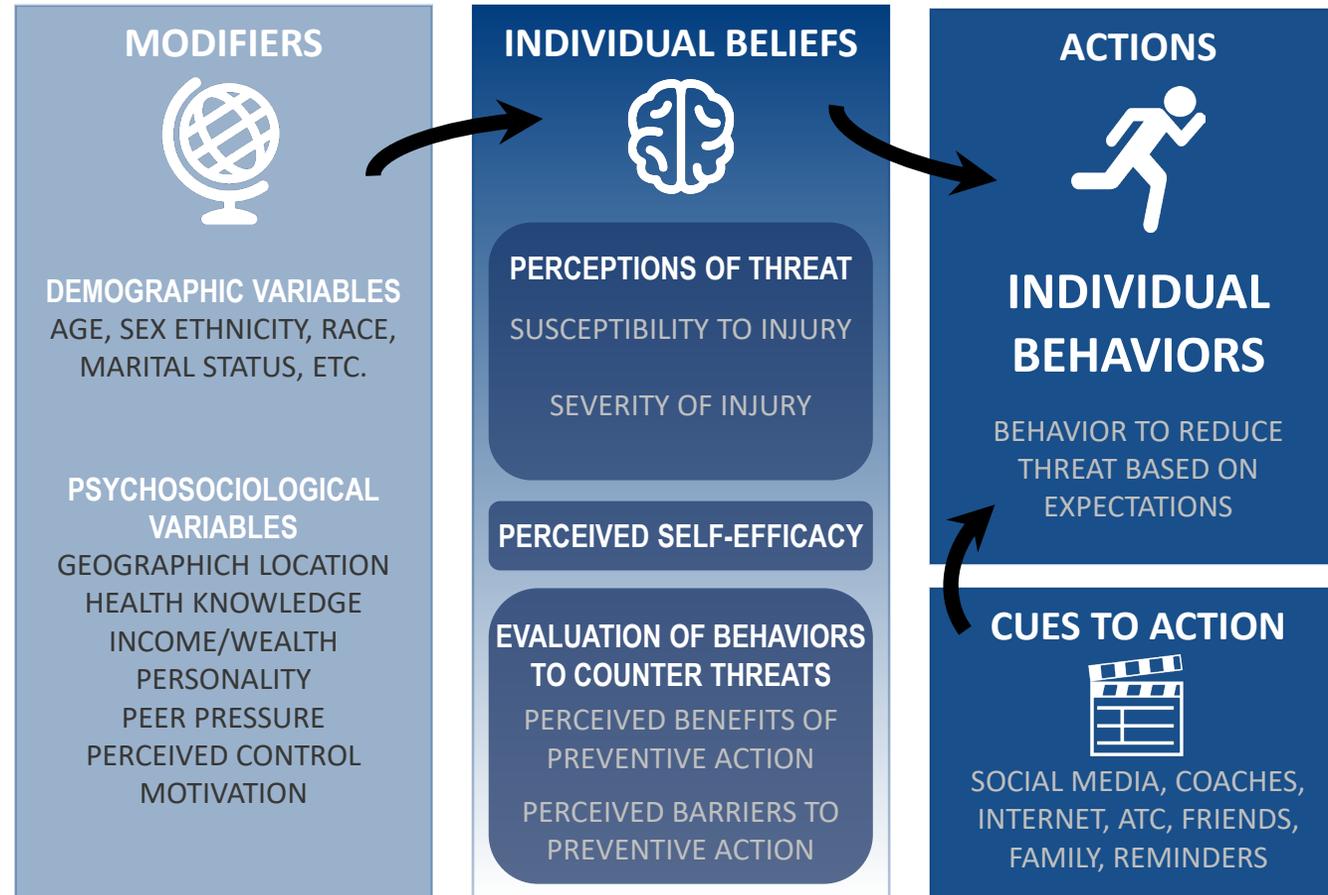
1. Running injury is very common
 - 18-92% hx of injury (van Gent 2007)
 - 84.2% hx of injury (Bachand, In Review)
2. Runners are worried about getting injured (Bachand, In Review)



Severity of Injury

- 1) Time Loss of injury (Lambert 2020)
 - ~10 weeks
- 2) Performance reduction (Lambert 2020)
 - 25-50% persistently reduced
- 3) Don't replace lost running activity with other forms of activity (Davis & Gruber 2020)
 - Return to running deconditioned?
- 4) Repeated and chronic injury may lead to osteoarthritis later in life

Health Beliefs Model





Objectives

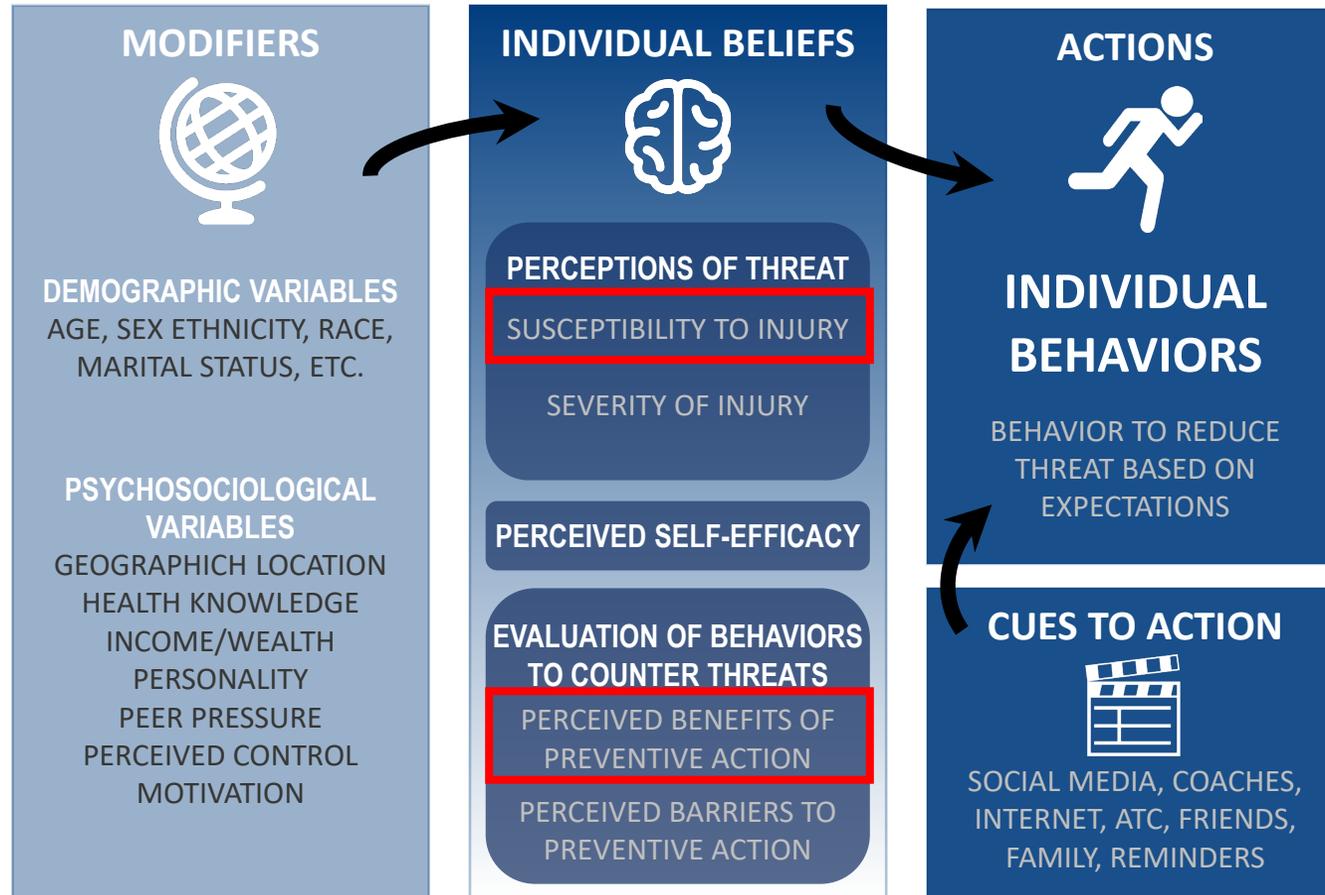
- 1) Summarize factors runners perceive to increase and decrease the risk of sustaining an RRI
- 2) Discuss how runners' beliefs can influence their actions, in both the context of training and rehabilitation
- 3) Discuss strategies for providing accurate, evidence-based injury information to runners



Objectives

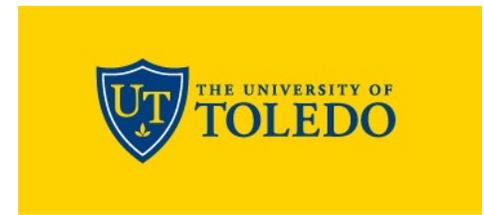
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Health Beliefs Model



Methods

- 688 Runners completed an online survey (71.2% competitive)
 - 386 Adults
 - 357 runners
 - 186 coaches
 - 302 Adolescents
- Experience: $15.2 \text{ y} \pm 8.3 \text{ y}$
 - 5 runs/week \pm 1.5 runs/week
 - 45.7 km/week \pm 24.8 km/week



Perceptions – Training Habits

- ✓ Supported by evidence
- ? Limited/inconsistent evidence
- ✗ Not supported/no evidence



Previous Injury	✓	Off Days	?
Hard surfaces	✗	Alternate hard/easy & long/short runs	?
High mileage	?	Cross-train	?
>10% increase	✗	Pre-season training	?
Downhill	?	Soft surfaces	✗



Knowledge Gaps - Training Habits

Runners

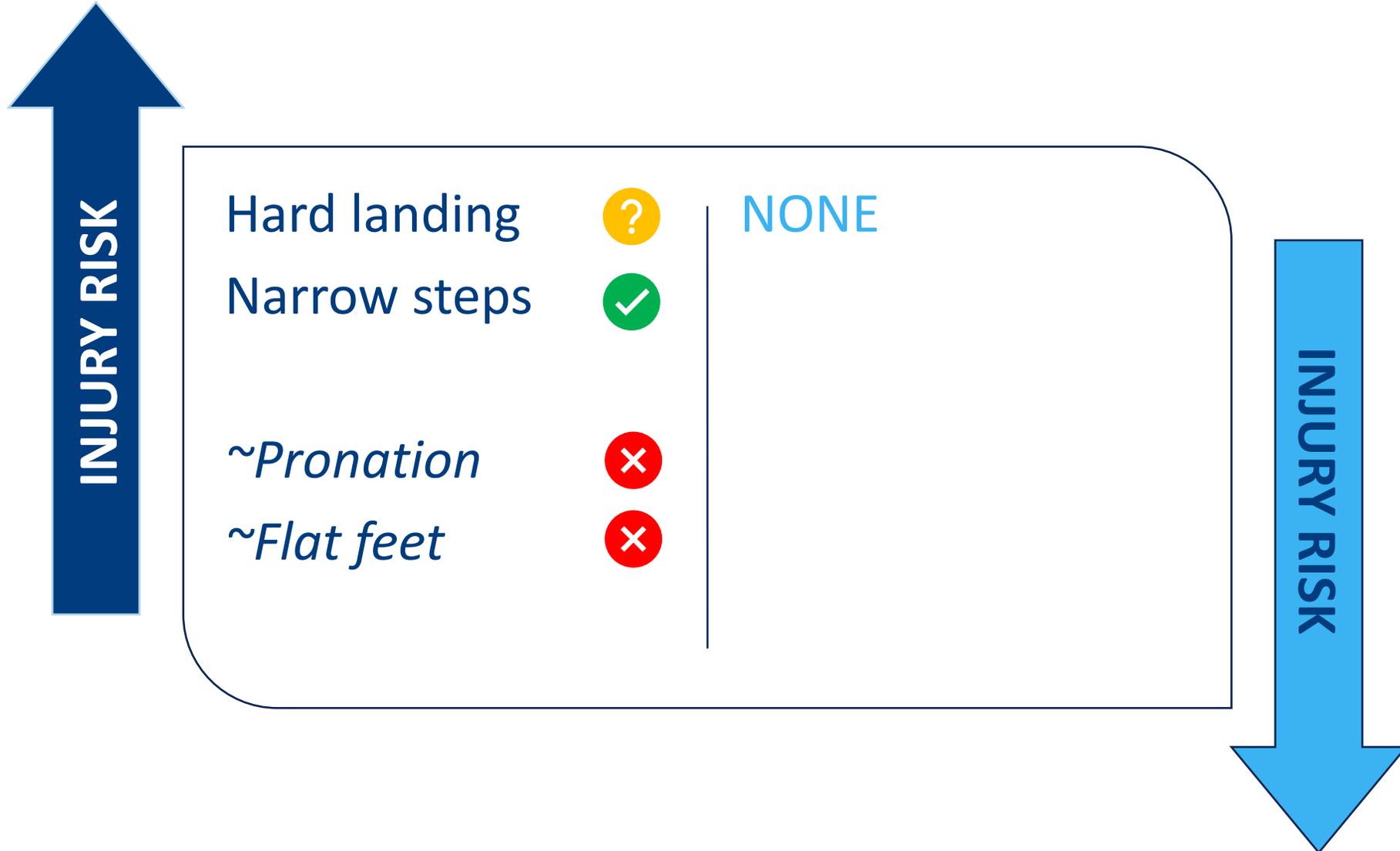
No major differences between groups

Adolescent Runners

Similar to all runners

Perceptions – Biomechanics

- ✓ Supported by evidence
- ? Limited/inconsistent evidence
- ✗ Not supported/no evidence



Knowledge Gaps - Biomechanics

Runners

Long strides (44%) ✓

Low cadence (31%) ✓

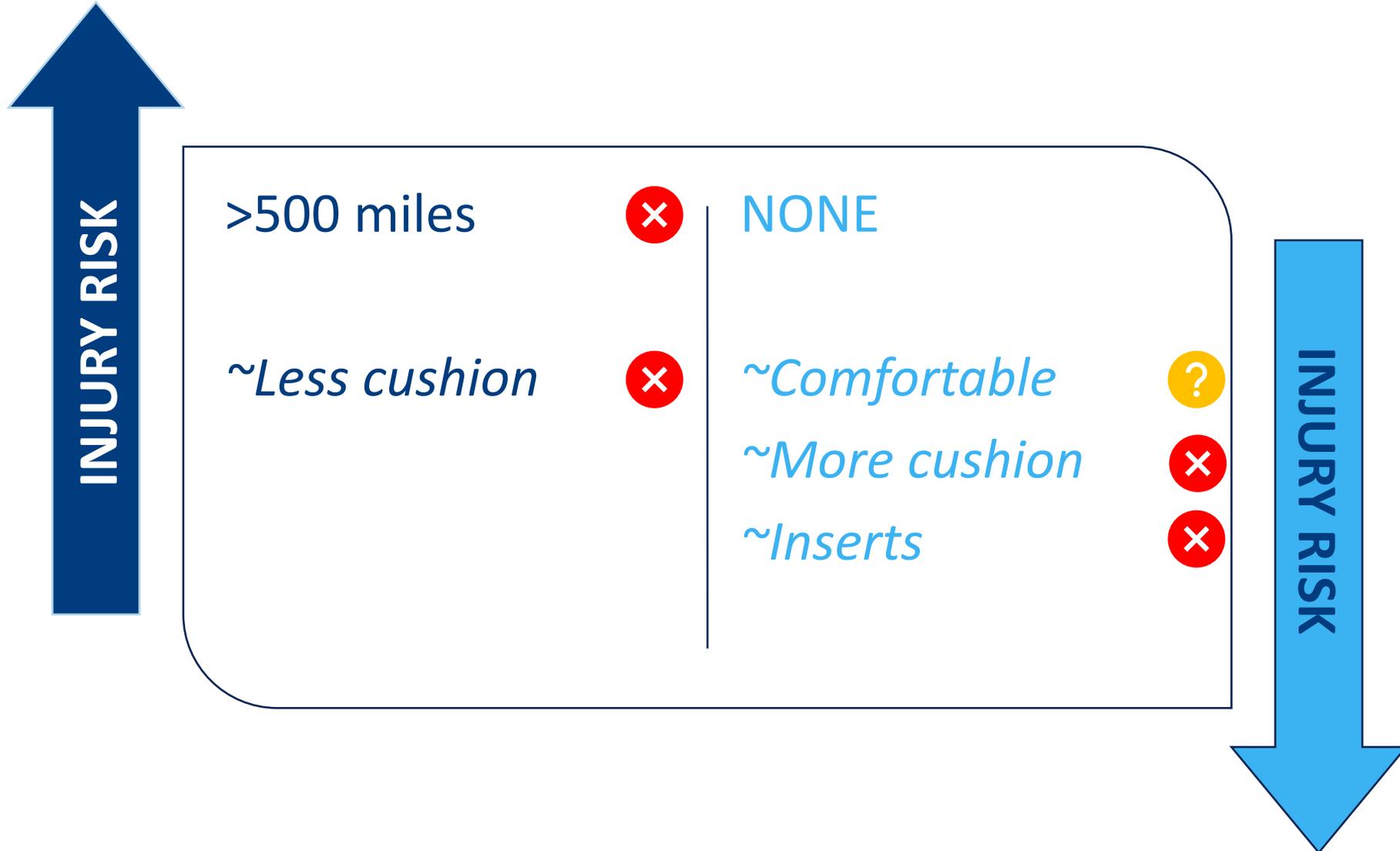
Adolescent Runners

LONG STRIDES (23%) ✓

LOW CADENCE (17%) ✓

Perceptions – Footwear

- ✓ Supported by evidence
- ? Limited/inconsistent evidence
- ✗ Not supported/no evidence



Knowledge Gaps - Footwear

Runners

Adolescent Runners

Stronger beliefs on footwear 

More cushioning (77%) +20% 

Less cushioning (73%) +20% 

Inserts (67%) +13% 

Perceptions – Strength/Stretch

- ✔ Supported by evidence
- ? Limited/inconsistent evidence
- ✘ Not supported/no evidence



Tight muscles	✘	Strong legs	?
		Strong core	✘
		Dynamic pre-run	✘
		Static post-run	✘
		<i>~High reps & low weight</i>	✘



Knowledge Gaps – Strength/Stretch

Runners

Adolescent Runners

Static pre (64%) +33%



Static post (85%) +12%



Perceptions – Nutrition

- ✔ Supported by evidence
- ? Limited/inconsistent evidence
- ✘ Not supported/no evidence



Poor bone health	✔	NONE
Low calcium diet	?	
<i>~Low energy availability</i>	✔	
<i>~Overweight</i>	✘	



Knowledge Gaps – Nutrition

Runners

Skinny (19%)

- **Does not inc/dec (61%)**



Adolescent Runners

Similar to all runners

-  Supported by evidence
-  Limited/inconsistent evidence
-  Not supported/no evidence

Summary Popular Beliefs

Increase Risk

- 1) Previous Injury (94.7%) 
- 2) Poor bone health (94.5%) 
- 3) Running on hard surfaces (93.4%) 
- 4) High mileage (90.8%) 
- 5) >10% increase in weekly distance (88.4%) 
- 6) Tight muscles (86.5%) 

Decrease Risk

- 1) Off days (93.8%) 
- 2) Alternate run types (92.7%) 
- 3) Cross-train (91.8%) 
- 4) Dynamic stretching (87.9%) 
- 5) Strong legs/core (86.6%) 
- 6) Running on soft surfaces (85.1%) 

Green=Appropriate

Yellow=Questionable

Red=Not needed



-  Supported by evidence
-  Limited/inconsistent evidence
-  Not supported/no evidence

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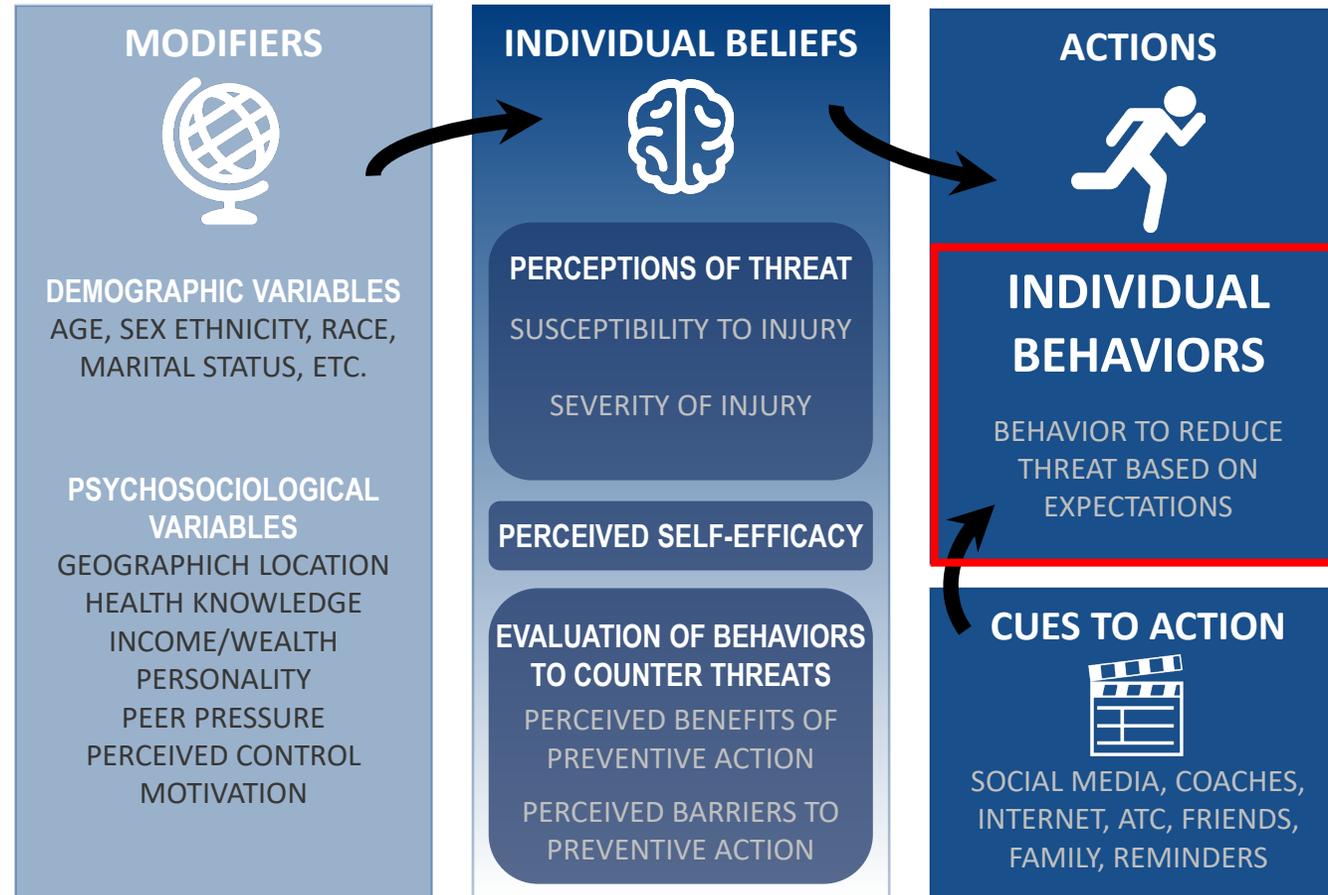




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Health Beliefs Model



Stretching

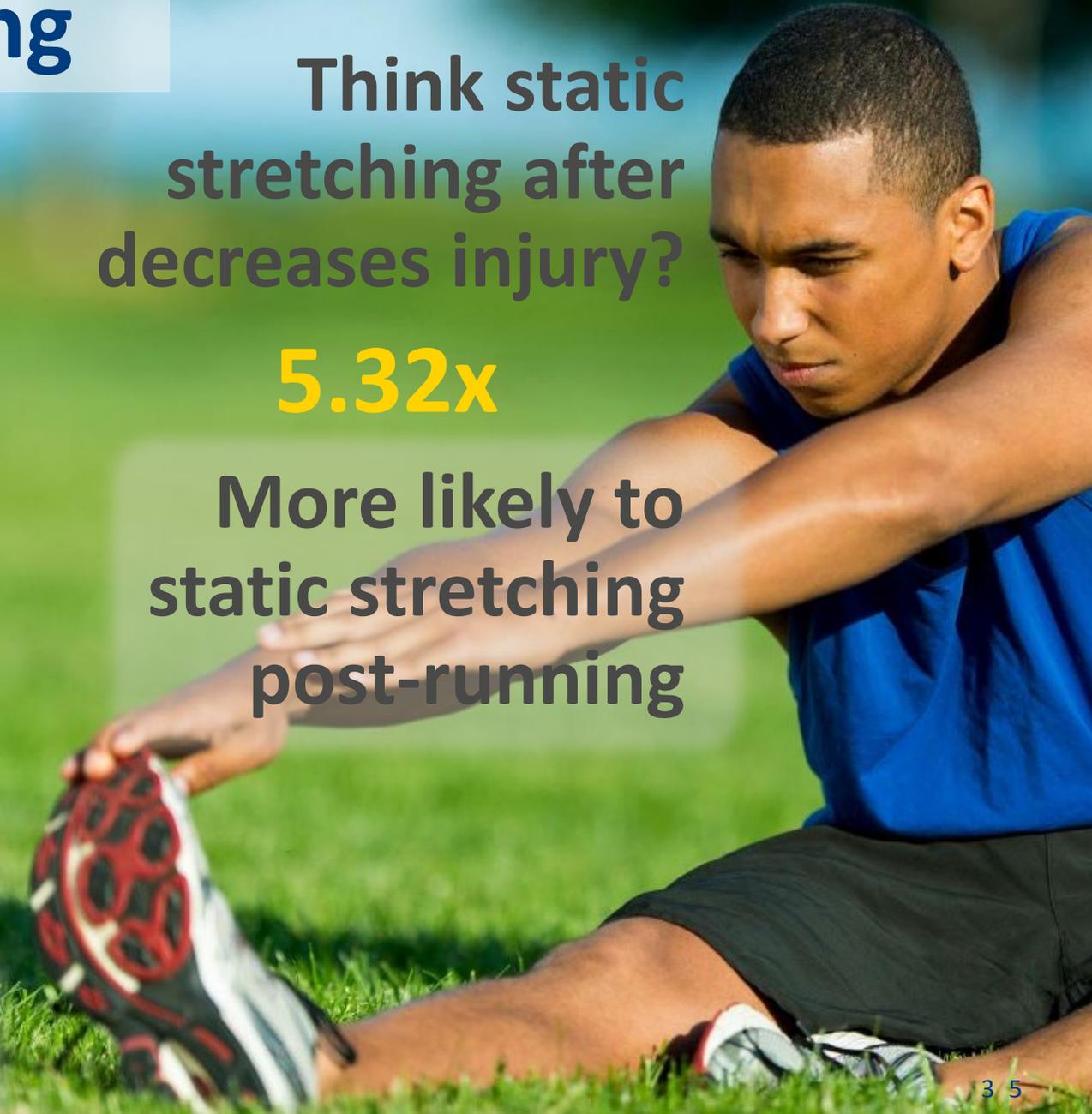


Think dynamic stretching before decreases injury?

3.38x

More likely to dynamic stretch pre-running

(Bachand In Preparation)



Think static stretching after decreases injury?

5.32x

More likely to static stretching post-running

Training Habits

Believe hard surfaces increase injury risk?

$\frac{1}{2}$

As likely to train on hard surface

(Bachand In Preparation)

Believe soft surfaces decrease injury risk?

6X

More likely to train on soft surface

Think non-heel
striking
decreases
injury?

2.5x

More likely to
be a non-heel
striker

Biomechanics

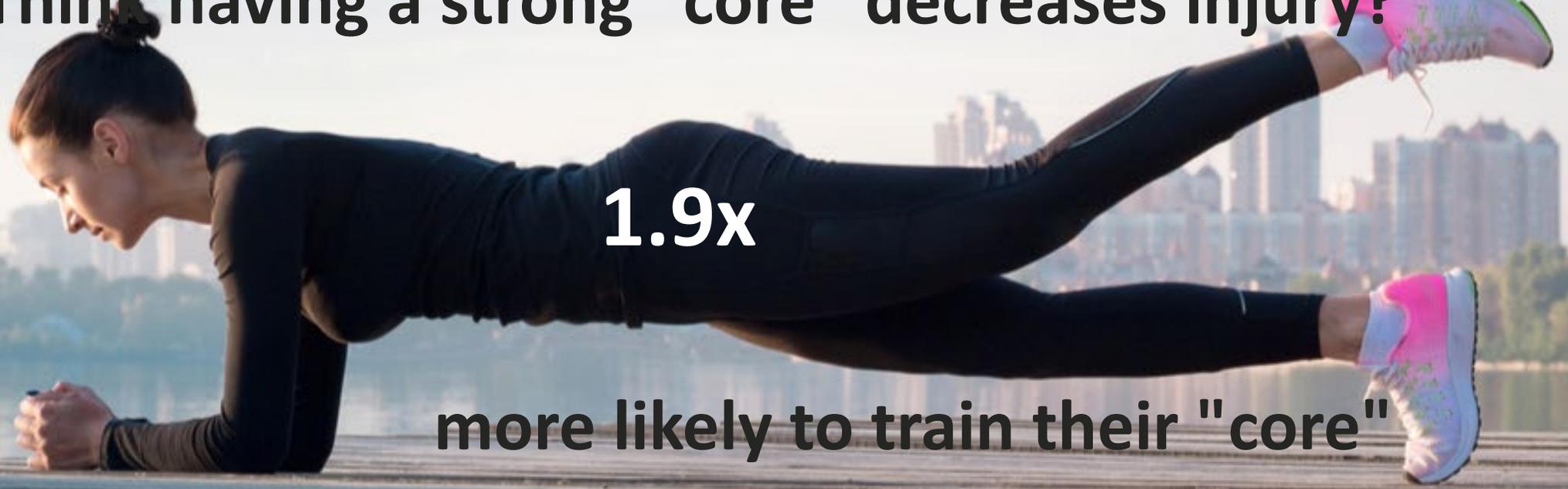
Think heel striking
doesn't impact
injury?

2.8x

More likely to be
a heel striker

(Bachand In Preparation)

Think having a strong "core" decreases injury?

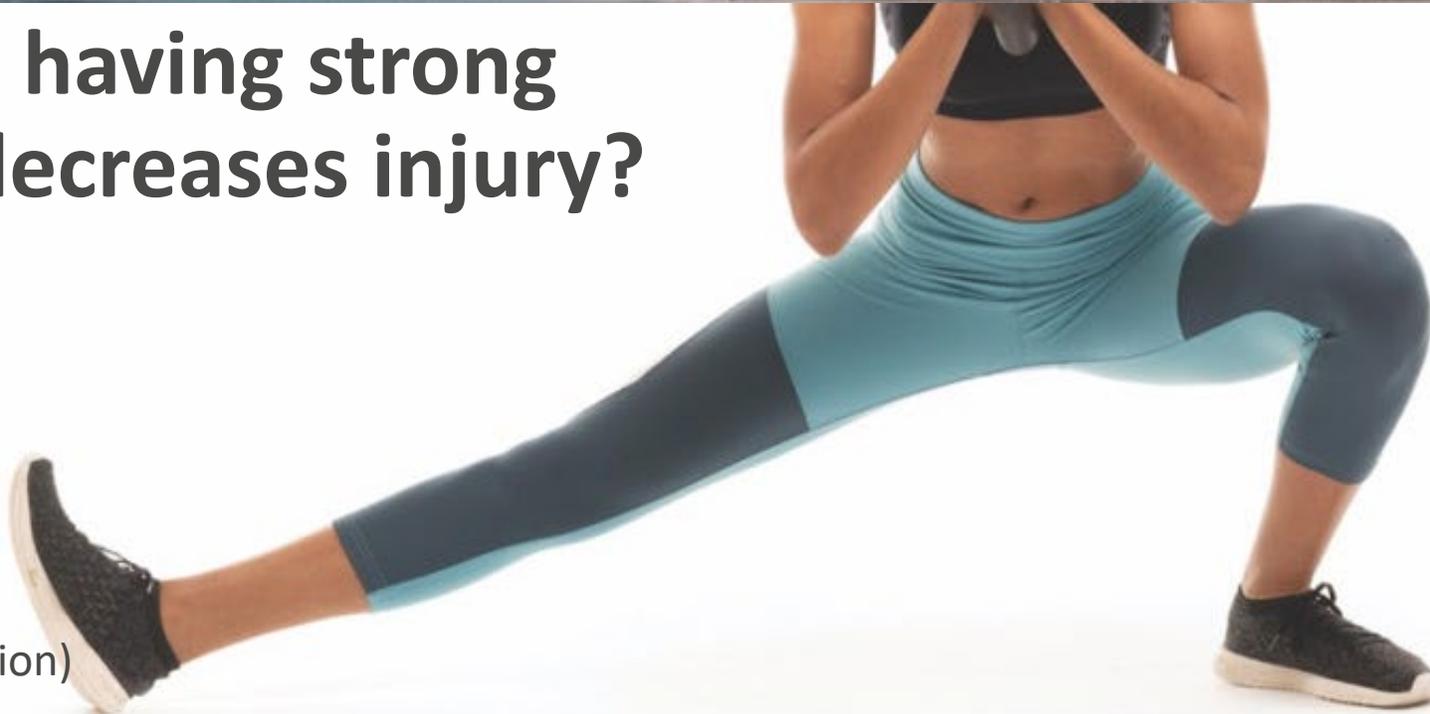


1.9x

more likely to train their "core"

Strength

Think having strong legs decreases injury?



2.0x

More likely to strength train legs

Training Habits

A person wearing a blue hoodie, black leggings, and bright orange sneakers is stretching on a paved road. They are wearing a red cap and have their hands on their knees, leaning forward. The background shows a road with a guardrail and trees under a bright sky.

Think off days decrease injury?

4.9 runs/week

Think off days increase injury?

5.0 runs/week

A person is running on a paved path during sunset. The sun is low on the horizon, creating a warm, golden glow and long shadows. The runner is wearing a purple and blue athletic top and a purple skirt. The path is flanked by green grass and trees.

Training Habits

Think high weekly distance
increases injury?

17.8 km/week

Think high weekly distance
decreases injury?

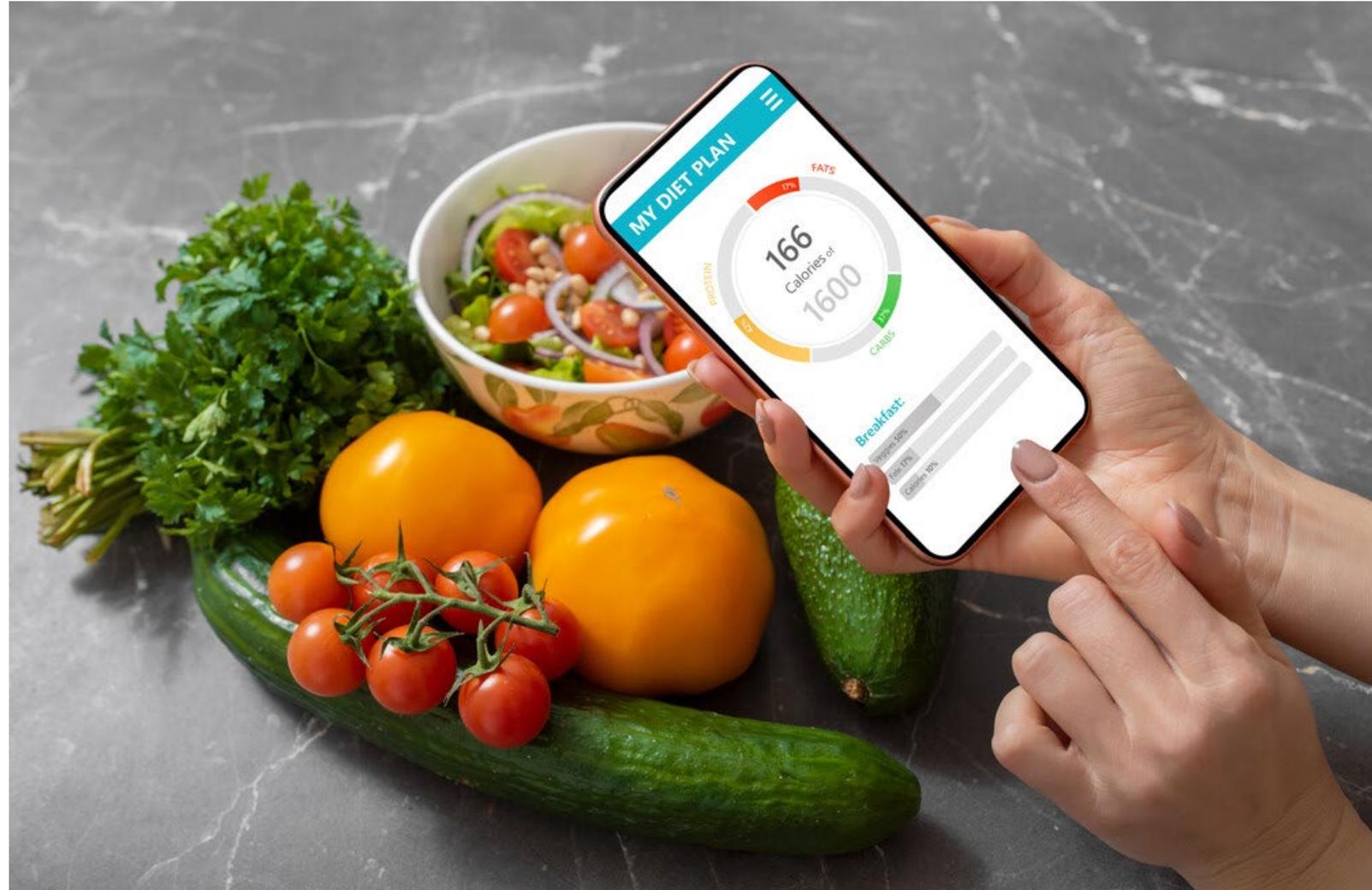
17.5 km/week

Nutrition

73% of runners believe low energy availability increases injury risk

- **11%** track caloric intake

12% of runners track caloric intake



(Bachand In Preparation)

Changing Belief \neq Changing Behavior

CHANGE



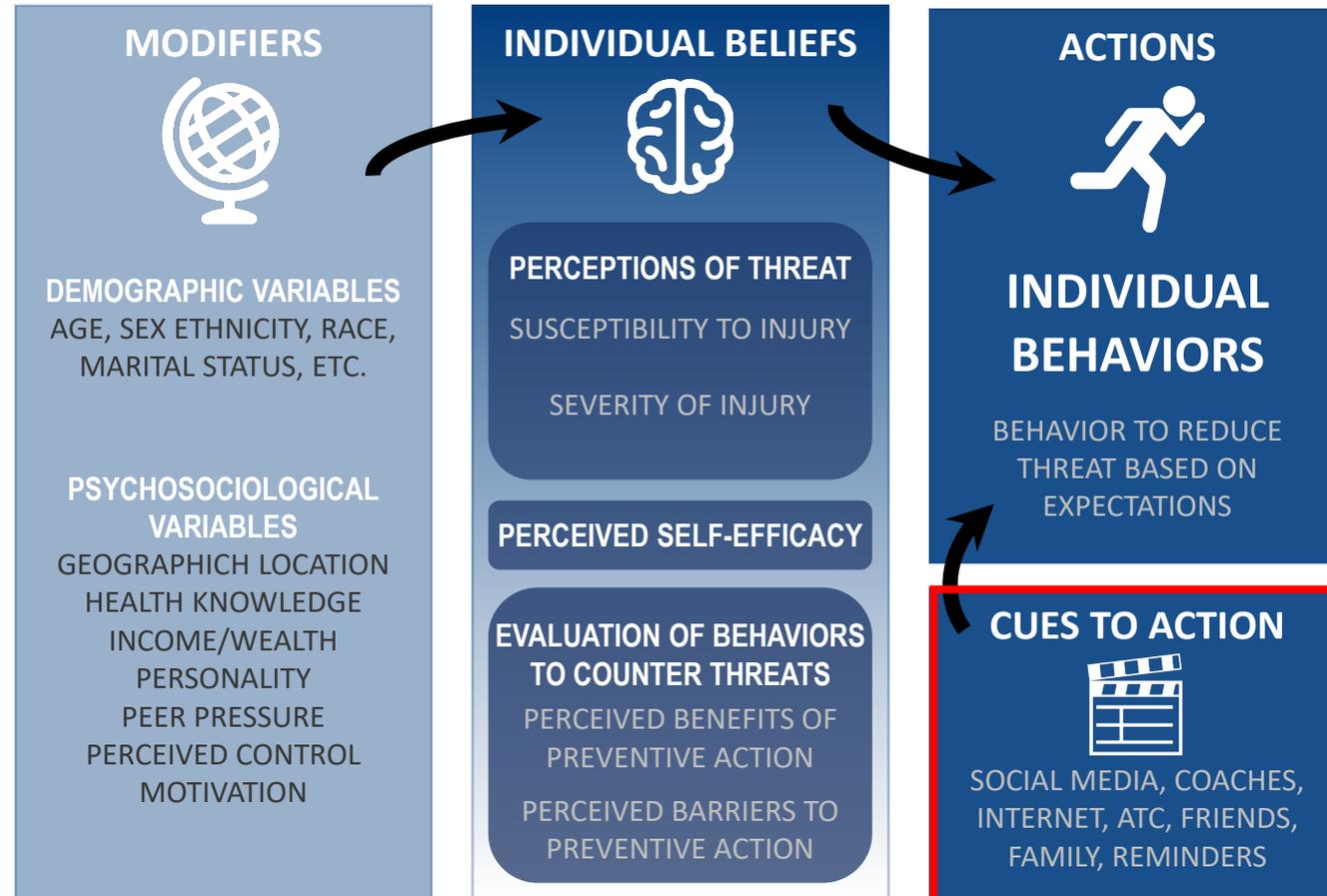
PROCESS...



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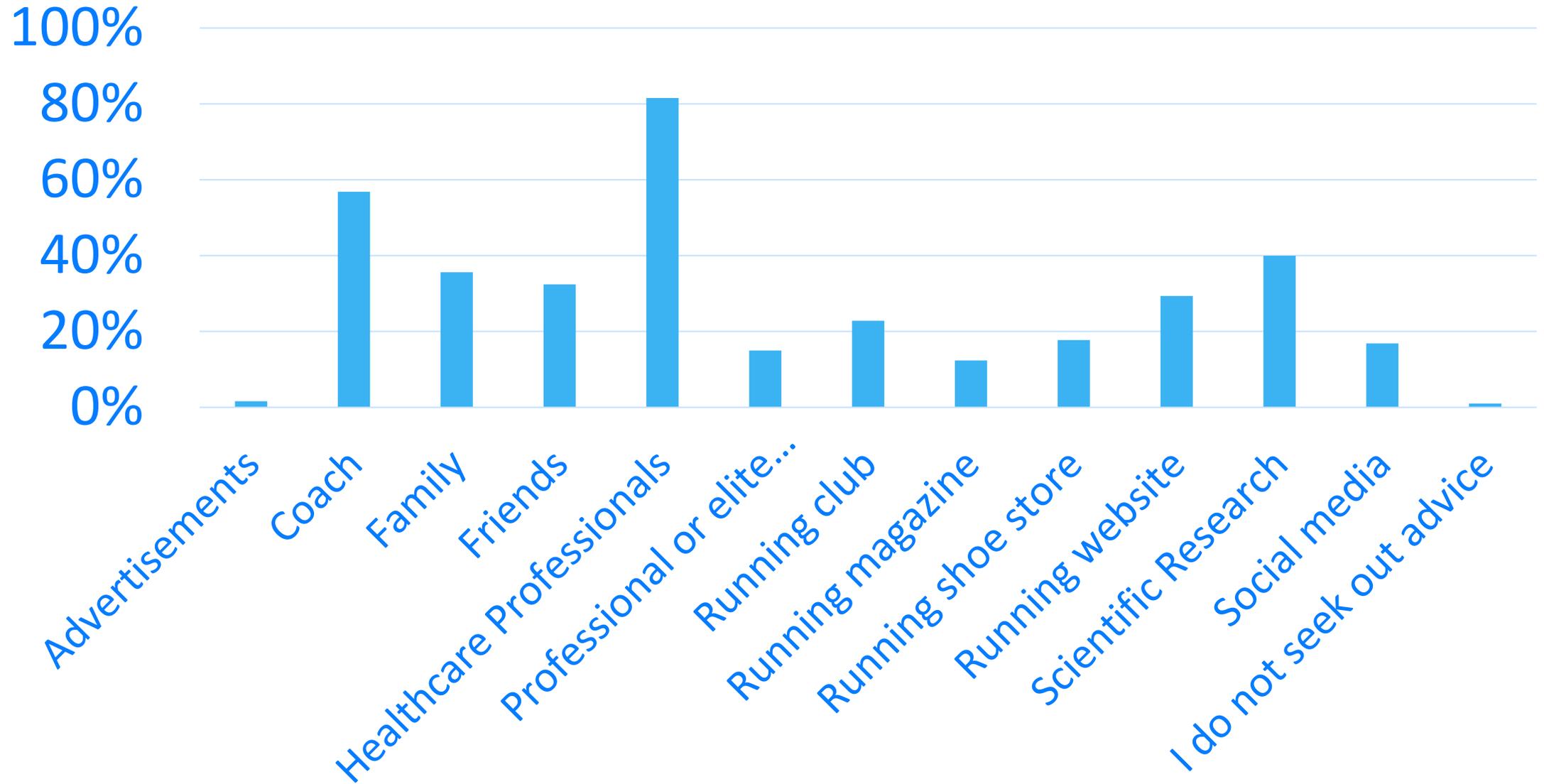
Health Beliefs Model



What Information Sources Do Runners Seek & Trust?



Sources of Information for RRI's



Information Sources

Adult Runners

1. Health Care Professionals
2. Scientific Research
3. Running Web Site
4. Friends
5. Coaches

Adolescent Runners

1. Health Care Professionals
2. Coaches
3. Family
4. Friends
5. Scientific Research

Are Health Care Professional Perceptions Accurate?

The background features a central, glowing orange ring with a soft, ethereal glow. This ring is surrounded by a field of numerous small, bright white and yellow stars, creating a cosmic or space-themed atmosphere. The overall color palette is dominated by dark blacks and greys, punctuated by the warm orange of the ring and the cool whites and yellows of the stars.

**Are Health Care Professional
Perceptions Accurate?**

Are Health Care Professional Perceptions Accurate?

Physiotherapists (Dhillon 2020)

- Agree:
 - Footwear is important in reducing injuries
 - Footwear is moderately important for treating injuries
 - Different footwear required based on injury status
- Disagree:
 - Matching foot type with shoe type decreases injury



Are Health Care Professional Perceptions Accurate?

Physiotherapists (Dhillon 2020)

- Agree:
 - Footwear is important in reducing injuries 
 - Footwear is moderately important for treating injuries 
 - Different footwear required based on injury status 
- Disagree:
 - Matching foot type with shoe type decreases injury 

Are Health Care Professional Perceptions Accurate?

Increase Injury

- Maximal cushioning 
- Changing footwear 

Reduce Injury

- Minimal cushioning 
- Softer shoe soles 
- Greater heel-to-toe drop 



(Dhillon 2020)

Are Health Care Professional Perceptions Accurate?

Physiotherapy Students (Wolthon 2020)

- Training errors (32.4%)
- Poor running form (26.1%)
- Old shoes (13.9%)
- Hard surfaces (13.4%)
- Foot-shoe mismatch (12.6%)
- Not alternating shoes (1.7%)



Are Others' Perceptions Accurate?

Coaches (Linton & Valentin 2020, Abran 2022)

- Training errors 
- Footwear 
- Foot strike pattern 
- Others
 - No/low conditioning
 - Hard surfaces
 - Ignoring injury
 - No warmup/cool down



Not different from runners overall
(Bachand In Preparation)



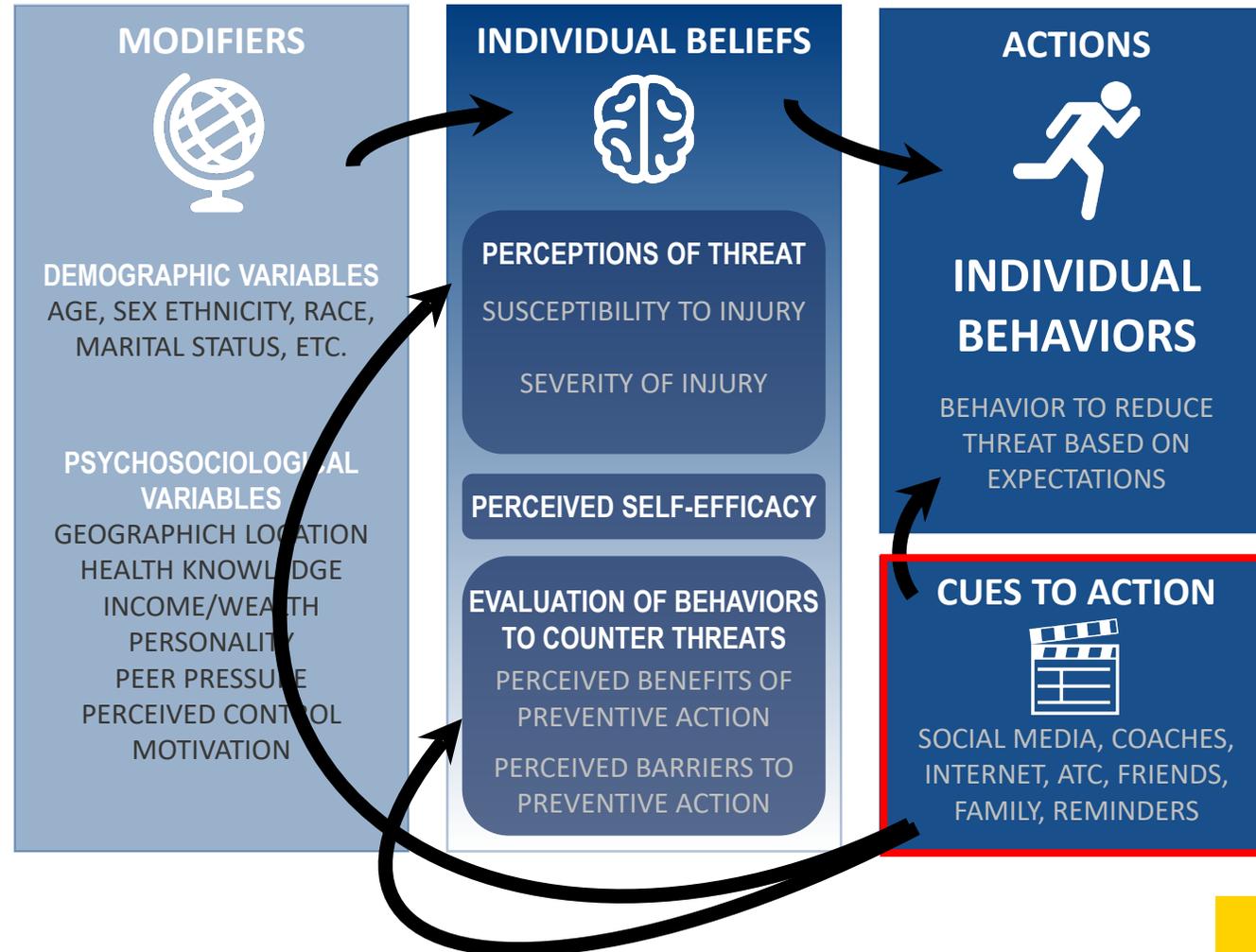
Are Others' Perceptions Accurate?

Running shoe salespersons (Wolthon 2020)

- Foot-shoe mismatch (32.1%) ❌
- Old shoes (23.1%) ❌
- Poor running form (15.4%) ?
- Training errors (14.1%) ?
- Hard surfaces (10.3%) ❌
- Not alternating shoes (5.1%) ❌



Health Beliefs Model



How do we best inform ourselves?



High-Quality Resources

PubMed.gov

Systematic Reviews



Foot Strike Pattern:

<https://link.springer.com/article/10.1007/s40279-019-01238-y>

Risk factors:

<https://bjsm.bmj.com/content/41/8/469.long>

Biomechanics:

<https://link.springer.com/article/10.1007/s40279-019-01110-z>

Prevention & Management of RRI:

<https://bjsm.bmj.com/content/56/22/1307>

Running & Knee Osteoarthritis

<https://journals.sagepub.com/doi/10.1177/0363546516657531>

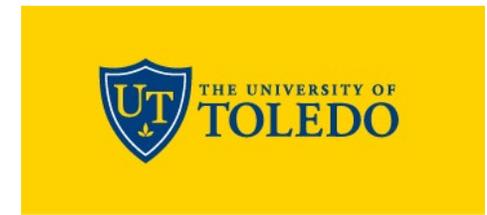
Expert Review: Youth & Running Injury

<https://journals.lww.com/acsm->

[csmr/Fulltext/2019/02000/Youth_Distance_Running_Strategies_for_Training.6.aspx](https://journals.lww.com/acsm-csmr/Fulltext/2019/02000/Youth_Distance_Running_Strategies_for_Training.6.aspx)



Sports Medicine



<https://meridian.allenpress.com/jat/issue/55/12>

Piecing Together the Puzzle of Running Injuries

J. Ty Hopkins, PhD, ATC, FNATA; Jay Hertel, PhD, ATC, FNATA

Characteristics of Injuries Occurring During Cross-Country: A Report from the Athletic Training Practice-Based Research Network

Ashley N. Marshall, PhD, ATC*; Tamara C. Valovich McLeod, PhD, ATC, FNATA†; Kenneth C. Lam, ScD, ATC‡

Session Rating of Perceived Exertion Combined With Training Volume for Estimating Training Responses in Runners

Christopher Napier, PT, PhD*†; Megan Ryan, BSc‡; Carlo Menon, PEng, PhD*; Max R. Paquette, PhD‡

Special Running Issue

Can the “Appropriate” Footwear Prevent Injury in Leisure-Time Running? Evidence Versus Beliefs

Laurent Malisoux, PhD*; Daniel Theisen, PhD†

Sport Specialization and Low Bone Mineral Density in Female High School Distance Runners

Mitchell J. Rauh, PhD, PT, MPH, FACSM*; Adam S. Tenforde, MD, FACSM†; Michelle T. Barrack, PhD, RD, CSSD‡; Michael D. Rosenthal, DSc, PT, SCS, ATC*; Jeanne F. Nichols, PhD, FACSM, CBDT§



High-Quality Resources

5 myths about strength training and endurance running

Key Points

- ✓ Resistance training may **reduce injury risk** while improving running performance in endurance runners.
- ✓ **Two sessions** per week targeting the **hip, thigh** and **calf** musculature with 2-4 sets of 4-10 slow, heavy reps, with 2-3 minutes of rest between sets is ideal.
- ✓ Key exercises to consider are **dead lifts, squats, lunges** and **calf raises** with additional exercises as needed to target an area of the body injured in the past.
- ✓ Targeting the **calf musculature** takes on added importance in the **masters runner**.

<http://semrc.blogs.latrobe.edu.au/5-myths-strength-training-endurance-running/>



Our Centre



Our Research



Blog



TREK

<http://semrc.blogs.latrobe.edu.au/lasem-running-resources/>

British Journal of Sports Medicine

BJSM MYTH STATIC STRETCHING REDUCES INJURY RISK IN RUNNERS

<https://bjsm.bmj.com/content/bjsports/54/17/1058.full.pdf>



La Trobe University (Australia)

MYTH #1

High repetition strength training is needed to improve running performance.

Myth 1:

<http://semrc.blogs.latrobe.edu.au/running-myth-high-repetition-strength-training-needed-improve-running-performance/>

MYTH #2

Not stretching enough causes injury.

Myth 2:

<http://semrc.blogs.latrobe.edu.au/running-myth-2-not-stretching-enough-causes-injury/>

MYTH #3

Wearing the wrong shoe type for your foot causes injury

Myth 3:

<http://semrc.blogs.latrobe.edu.au/running-myth-3-wearing-wrong-shoe-type-foot-causes-injury/>

MYTH #4

Running is bad for your knees

Myth 4:

<http://semrc.blogs.latrobe.edu.au/running-myth-4-running-bad-knees/>

MYTH #5

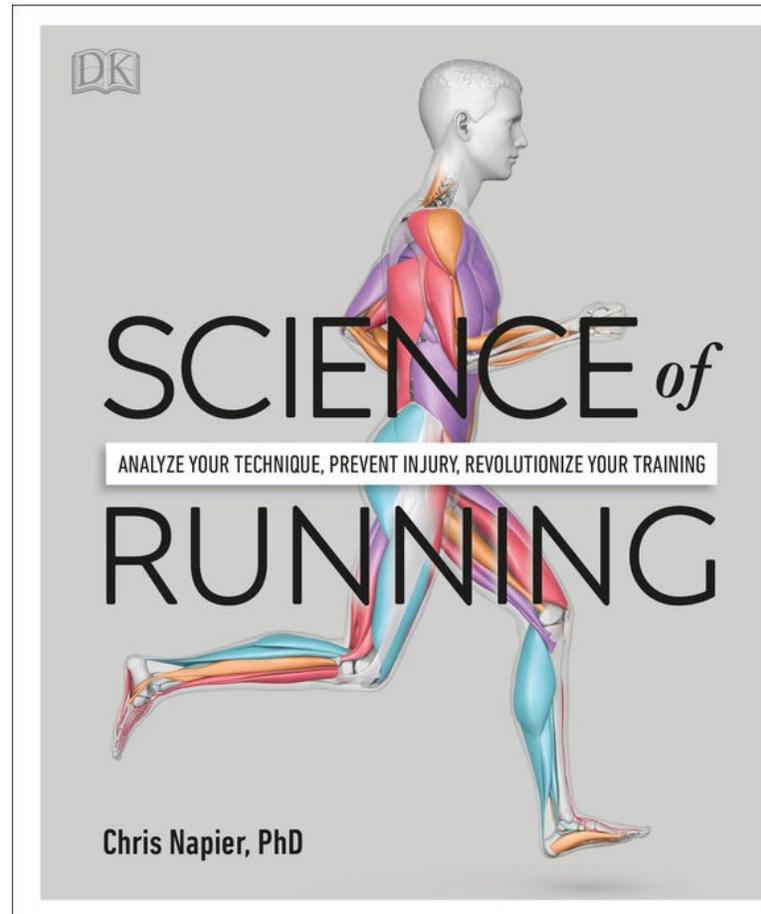
Switching to a forefoot strike and running barefoot or in minimalist shoes reduces your injury risk

Myth 5:

<http://semrc.blogs.latrobe.edu.au/running-myth-5-switching-forefoot-strike-running-barefoot-minimalist-shoes-reduces-injury-risk/>



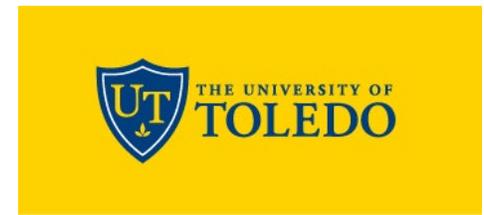
Moderate-Quality Resources



<https://www.amazon.com/Science-Running-Technique-Revolutionize-Training/dp/1465489576>



Lower-Quality Resources





Educating Others

- Runners
- Coaches
- Parents



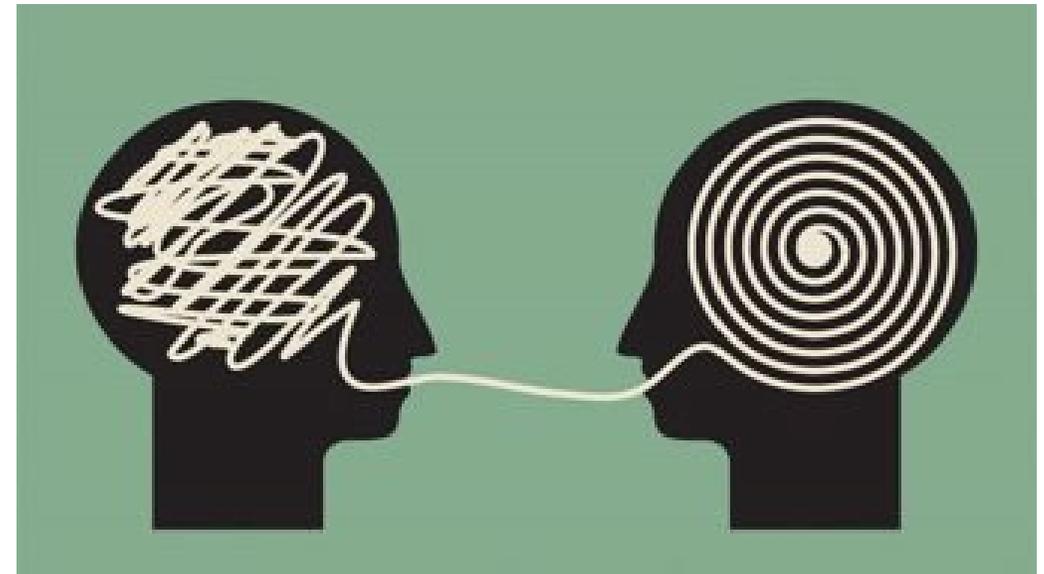
Educate Runners in Groups

- Strategies often need to fit the group
- Social nature of running makes the group powerful

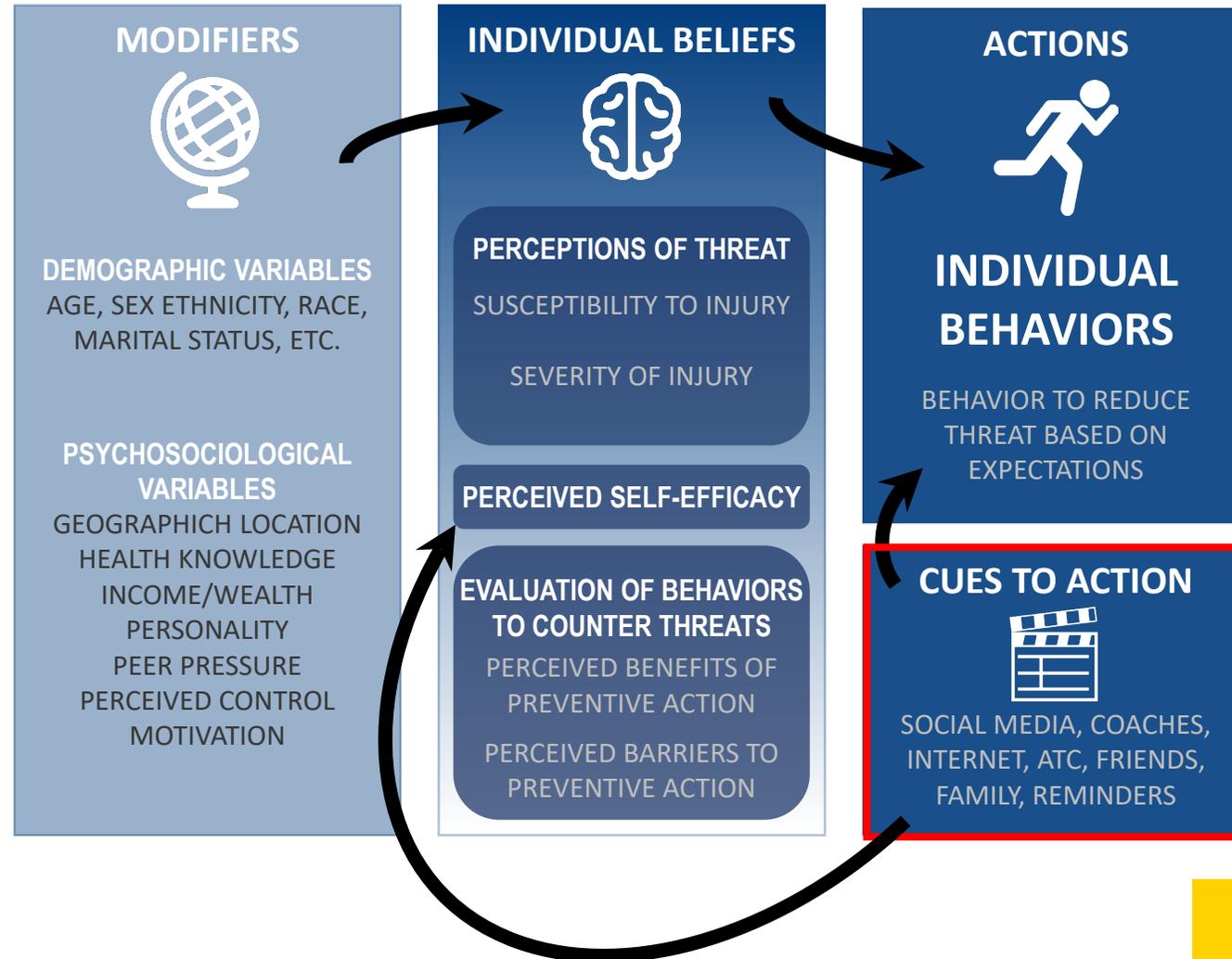


Understand Coaches Understanding

- Adolescent runners trust coaches
- Engage coaches
- Coaches trust “research”
- **BUT** their beliefs will be difficult to change quickly



Health Beliefs Model



Self-Efficacy

An individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments



Self-Efficacy



Strategies to Improve Self-Efficacy

Skills mastery

- Breaking down skills to be learned into very small, manageable tasks
- Increases likelihood of success



Strategies to Improve Self-Efficacy

Modeling

- Patient becomes aware of someone else with a similar problem

*Best if this is someone who looks like them and is as similar as possible

*Avoid extreme cases (high performers, etc.)



Strategies to Improve Self-Efficacy



Social persuasion

- Verbal: urge and encourage the patient to do slightly more than he or she is now doing
- Intentional, goal oriented



Can Education Change Beliefs?

Online module changed beliefs (Dhillon 2020)

- Don't know if it changed behavior

Developing materials for runners specifically may help to improve knowledge

Case Study

17 yo female cross-country runner

Hx of BSI

High mileage, top performer

Typical meals:

B: Toast with Jelly

L: Chips, apple, milk

Pre-run: skittles

D: Whatever parents make

Beliefs:

Low energy availability increases risk

Being skinny not risk factor

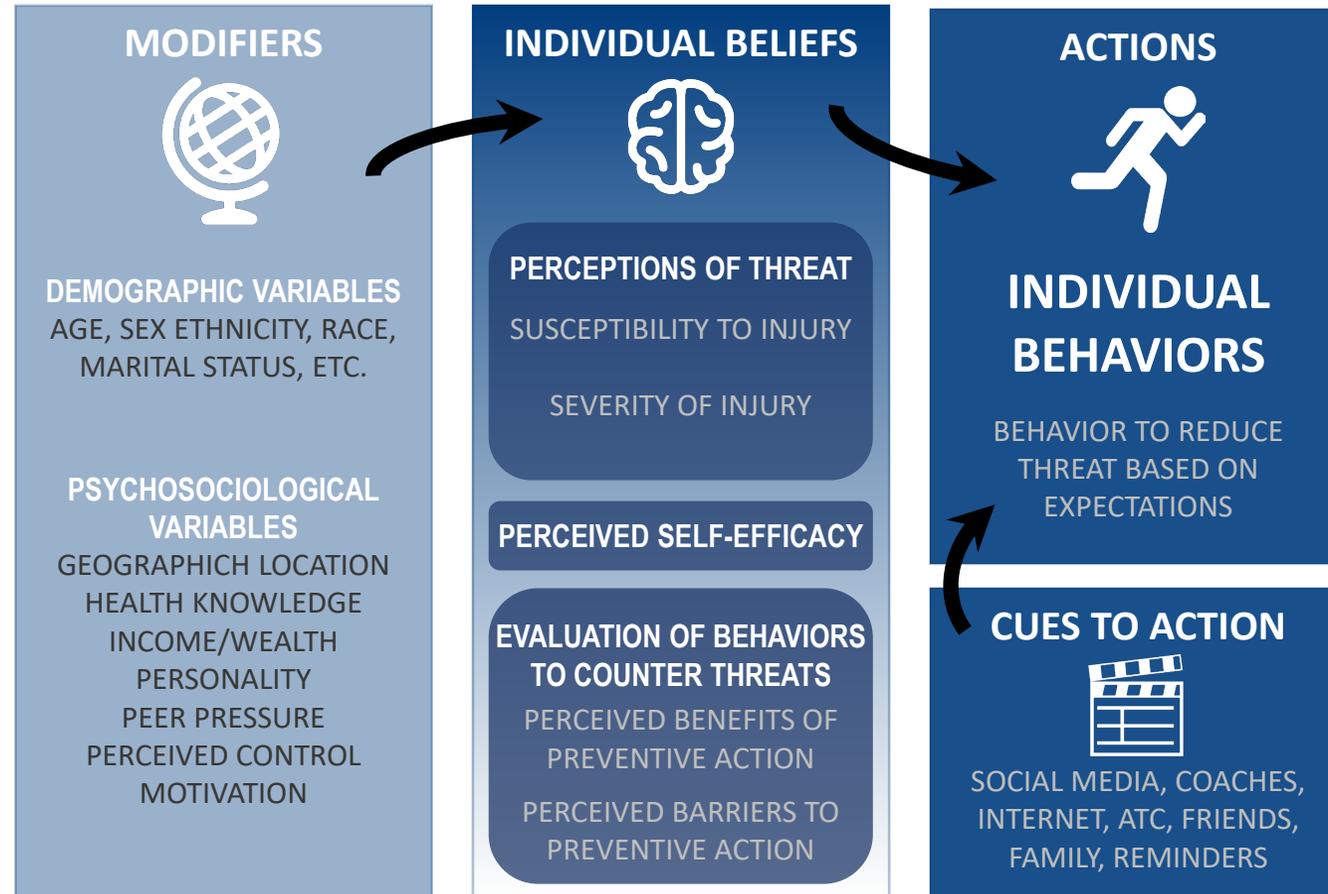
Cushioned shoes reduces risk

No knowledge about cadence

Strength training will make me bulky



Health Beliefs Model



Adolescent Running Workload Study



NATA
RESEARCH &
EDUCATION
FOUNDATION

https://toledouw.iad1.qualtrics.com/jfe/form/SV_2IEsL1mh7RMvJsy

