

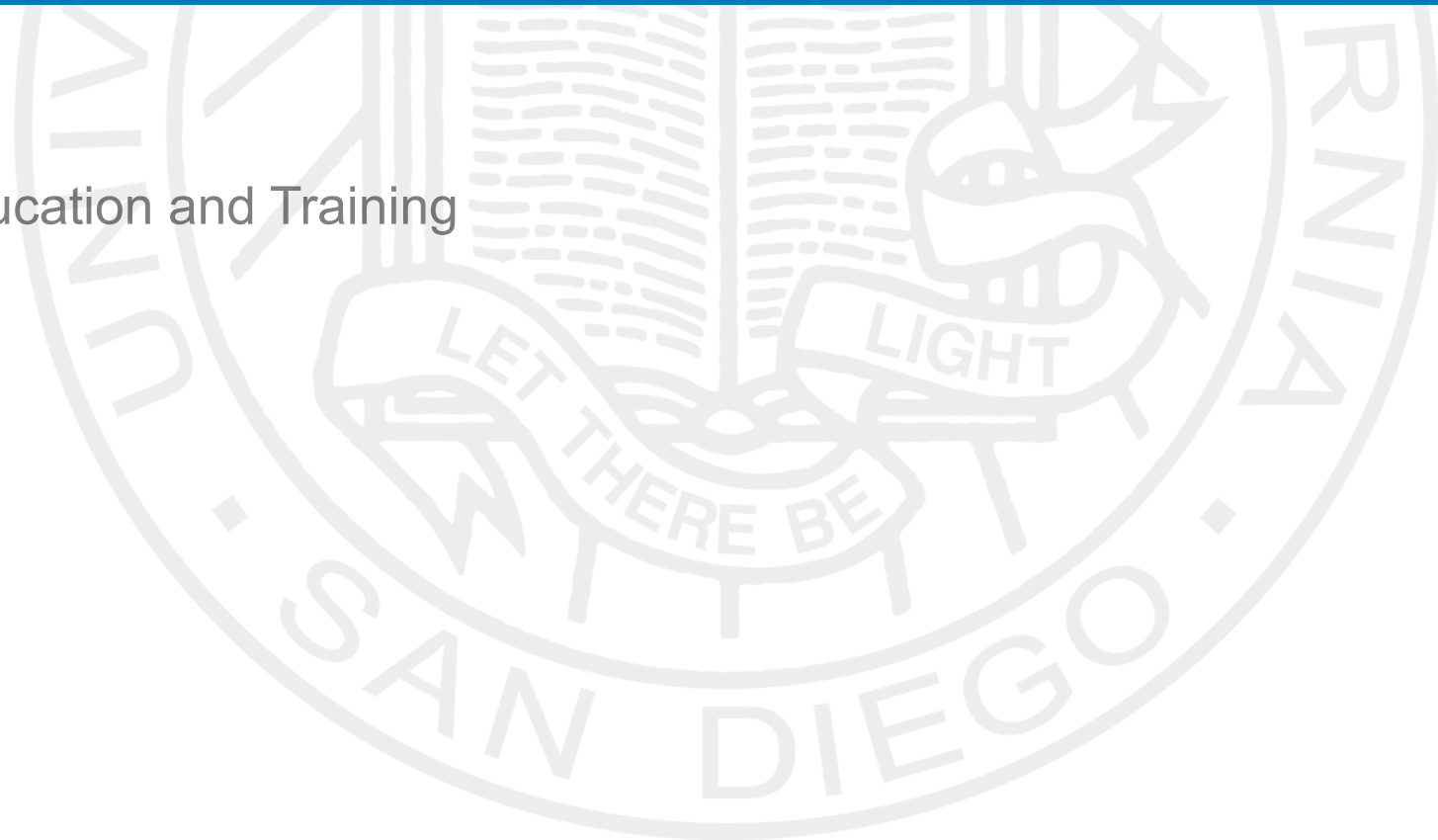
Introduction to Cognitive Bias in Decision Making and the Impact on Patient Safety

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RETHINKING MEDICAL PHYSICS



Cognitive Errors in Healthcare

Why should we care about cognitive errors?

- They occur frequently in healthcare
- They can have significant negative impacts for our patients

Let's take a closer look at:

- What we mean by cognitive error
- Some of the factors that predispose us to making cognitive errors

What is Cognitive Error?

Cognitive error is a thought process mistake that occurs during sensemaking

- **Thought process** – carefully considering something, or a series of conclusions
- **Sensemaking** – figuring out what's going on

Cognitive Error Example

Task

Treat a lung tumor using respiratory gating



Outcome

Treatment misadministration

- Multiple lesions
- Largest lesion identified as target (it is the easiest one to see)
- One of the smaller lesions is the intended target

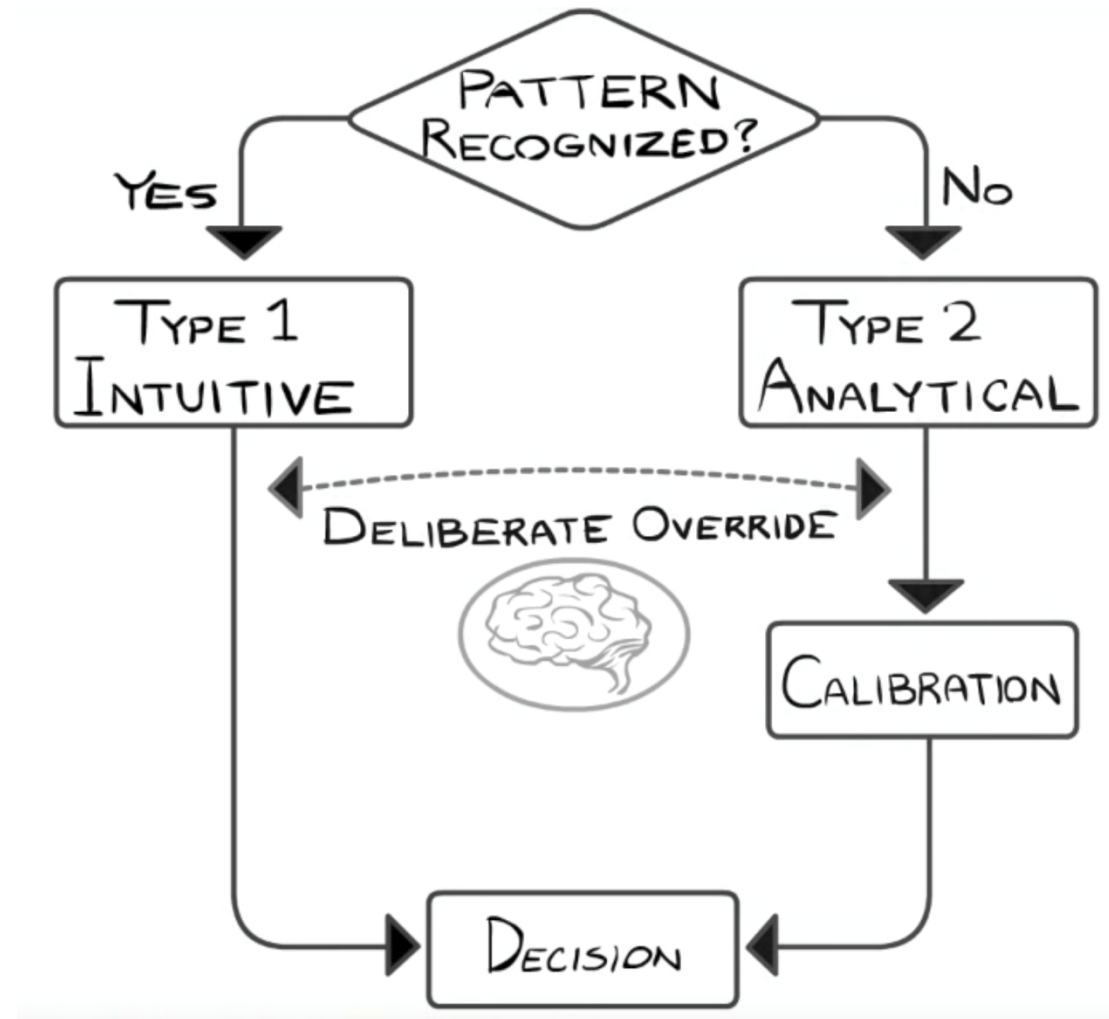
How do we think?

Type 1 thinking

- Fast and efficient
- Governed by heuristics
- Use very little mental effort

Type 2 thinking

- Deliberate and analytical
- Can be used to override type 1 decisions



Marjorie Stiegler, MD. "Understanding and Preventing Cognitive Errors in Healthcare."

Cognitive Error Example

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Predisposing Factors

What factor predispose us to cognitive error?

- **Person Factors**

- Cognitive loading/fatigue/stress/feelings towards patients/colleagues

- **System Factors**

- Workflow design/task complexity/time constraints
- Poorly designed/integrated or inaccessible IT
- Distractions, interruptions, noise, poor lighting

Rudeness

How does rudeness impact performance?

- **Riskin et al (Pediatrics, Sep 2015) studied this**
 - Randomized 24 NICU teams
 - Exposed to either rude or neutral comments
 - Assessed based on diagnostic and procedural performance

Rudeness

How does rudeness impact performance?

- **Results**

- Composite diagnostic and procedural performance scores were lower for members of teams exposed to rudeness
- Rudeness alone explained nearly 12% of the variance in diagnostic and procedural performance

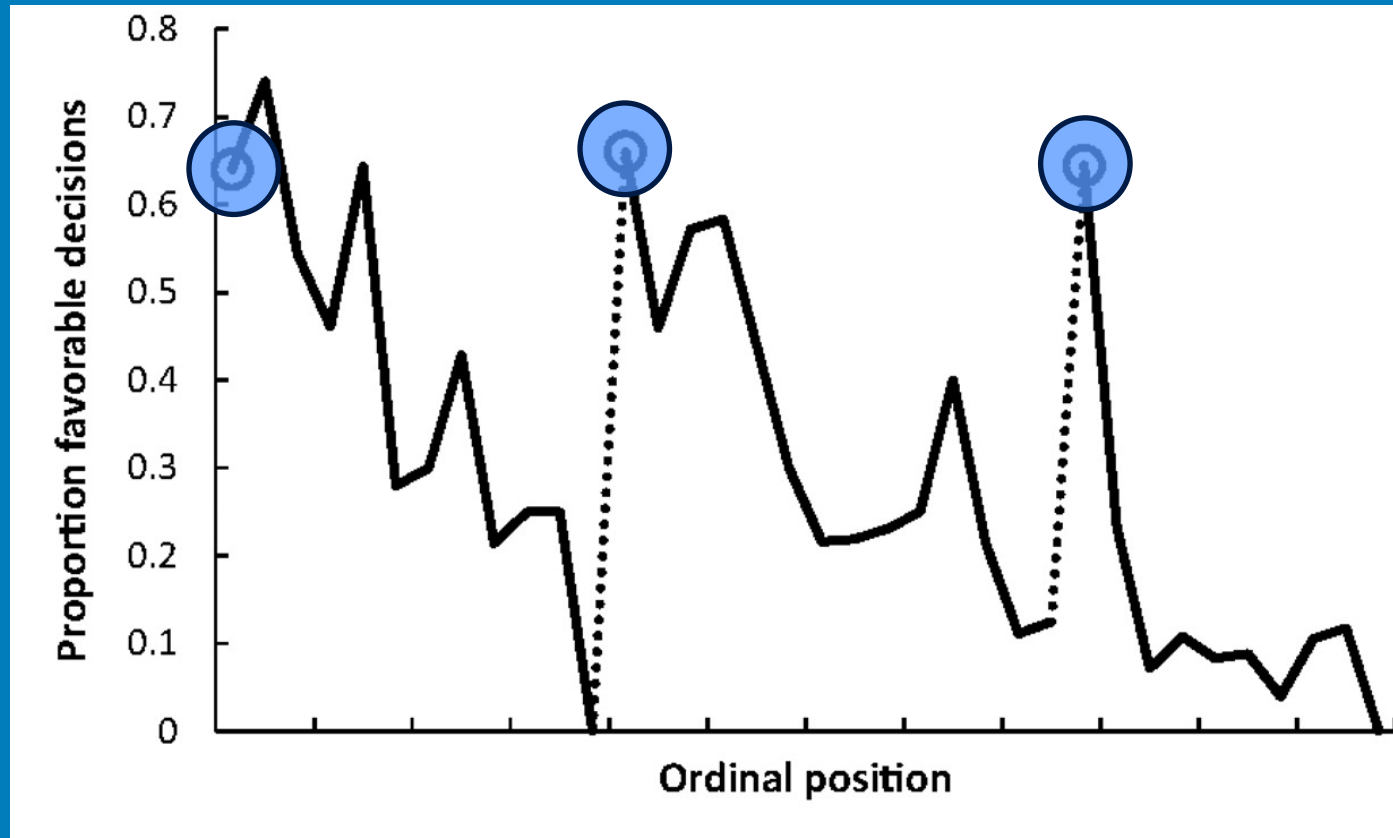
Fatigue

How does fatigue impact performance?

- **Danziger et al. (PNAS 2011) studied this**
 - Retrospective review of 1,112 parole rulings over 10 months
 - Decisions made by 8 judges
 - Deliberations are split into three sessions with two food breaks in between session

Fatigue

Proportion of rulings in favor of the prisoners by time of day



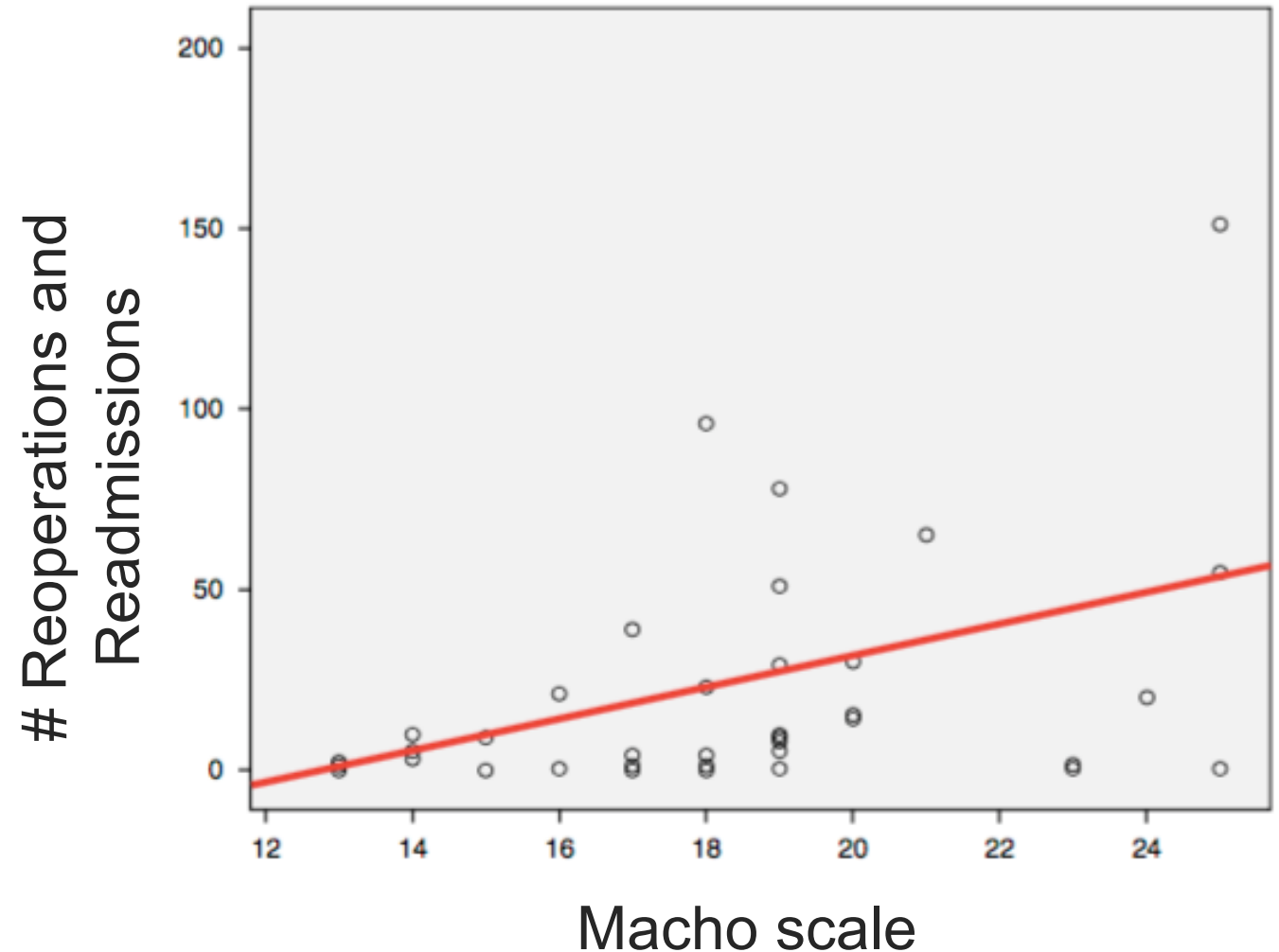
Attitude

How does attitude impact decision making?

- **Kadzielski et al. (Clin Orthop Relat Res, 2015) studied this**
 - Prospective review of 31 orthopedic surgeon reoperation/readmission rates
 - Surgeon's attitudes assessed using validated aviation psychology tools
 - Examined correlation between attitude and reoperation/readmission rate

Attitude

- They found a correlation between macho attitudes and reoperation/readmission rate
- Macho attitude alone accounted for 19% of variance



Attitude

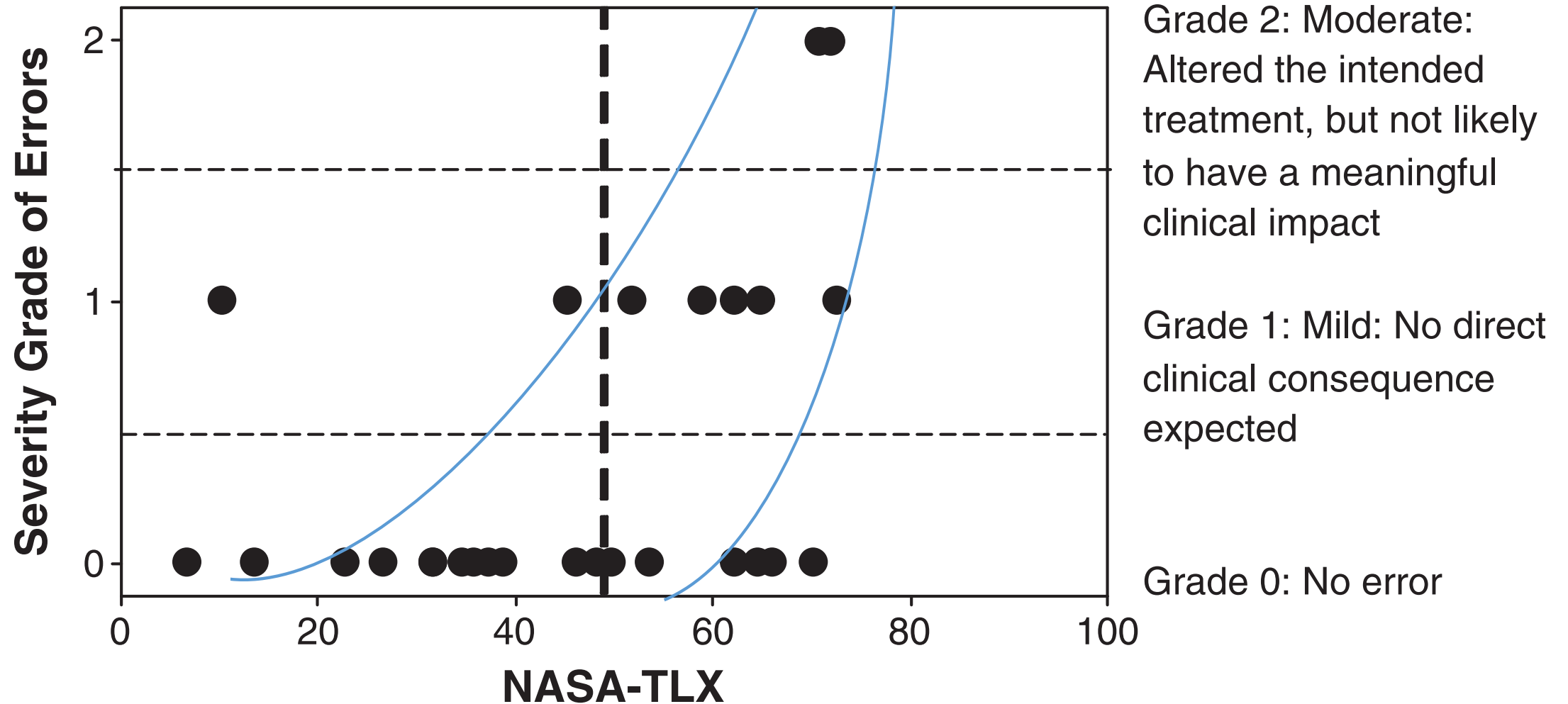
What is a macho attitude?

- **Authors define a macho attitude as:**
 - Being found in pilots who continually try to prove themselves better than others
 - They tend to be overconfident and attempt difficult tasks for the admiration it gains them

How does this translate to rad onc?

- **Mazur et al. (2014) studied this**
 - Prospective – 9 physicians planned 3 cases each
 - Perceived workload assessed using NASA-TLX tool
 - Performance based on severity of errors
 - Examines relationship between perceived workload and performance

How does this translate to rad onc?



Decision making is precarious at best

Hopefully we've convinced you that decision making is a precarious affair, at best!

- How can you recognize when you are making a bad decision?
- Remember, being wrong feels the same as being right
- Step 1 – know the more common cognitive biases

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