



# Lowering the Cognitive Barriers to Effective Health Self-Care

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# Why Does IQ Predict Health & Longevity?

- The “usual suspect”—material resources
  - Higher IQ → better job → richer → better health care
  - Richer parents → better health care  
→ higher IQ
- ★ ■ Neglected “suspect”—mental resources
  - Higher IQ → better learning/reasoning → self-care

# My Argument

## 1. Self-care is as important as medical care

- healthful diet, exercise, not smoke
- get preventive care
- prevent accidents
- manage chronic diseases
- etc.

## 2. Effective self-care is a cognitively demanding job

# Chronic Diseases Are Like Jobs

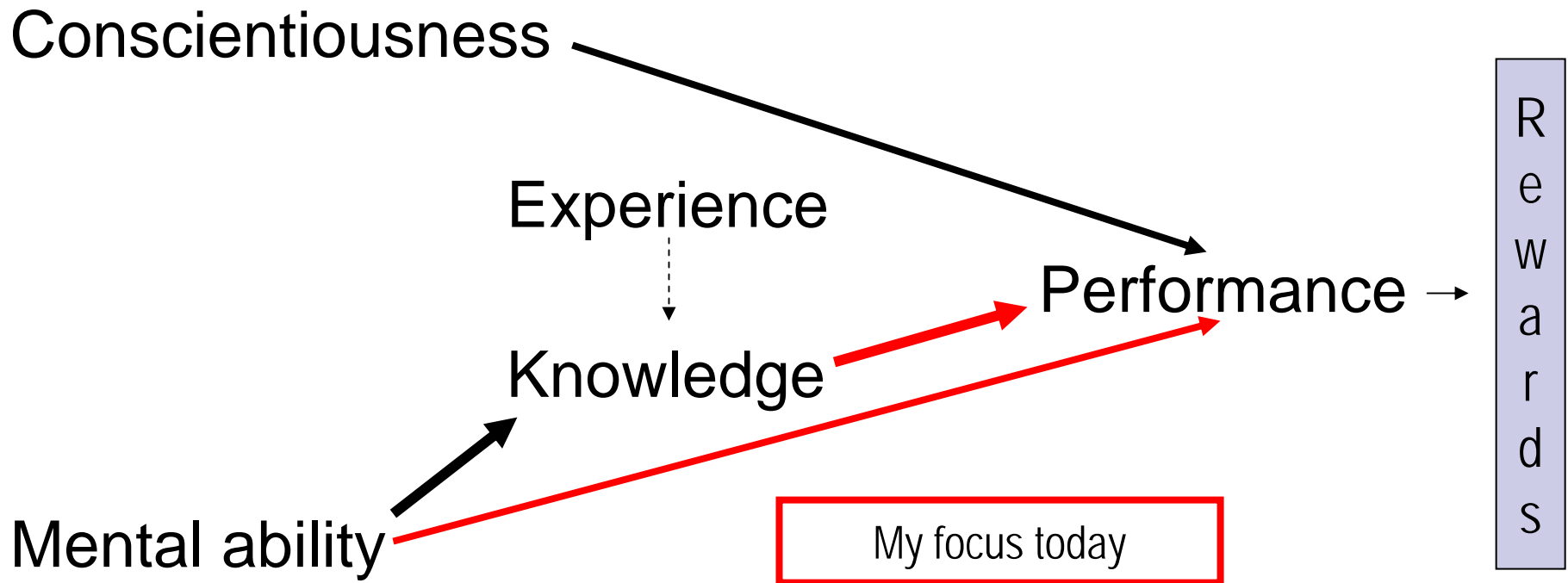
- Set of duties to perform
  - Requires training
- Multitask, deal with ambiguity
  - Coordinate & communicate with others
  - Exercise independent judgment
- Only occasional supervision
  - Job changes as technology & conditions evolve
  - Often tiring, frustrating, affects family life
  - Central to personal well-being
  - Lifelong
  - **But no vacations, no retirement**

# Example: The Diabetic's Job

- **Learn about diabetes in general (At “entry”)**
  - Physical process
  - Interdependence of diet, exercise, meds
  - Symptoms & corrective action
  - Consequences of poor control
- **Apply knowledge to own case (Daily, Hourly)**
  - Implement appropriate regimen
  - Continuously monitor physical signs
  - Diagnose problems in timely manner
  - Adjust food, exercise, meds in timely and appropriate manner
- **Coordinate with relevant parties (Frequently)**
  - Negotiate changes in activities with family, friends, job
  - Enlist/capitalize on social support
  - Communicate status and needs to care providers
- **Update knowledge & adjust regimen (Occasionally)**
  - When other chronic conditions or disabilities develop
  - When new treatments available
  - When life circumstances change

# Mental Ability is Best Single Predictor of Job Performance

(Summary of Meta-Analyses)



# Crucial: IQ Predicts Performance Best in the Most Complex Jobs

Predictive validity



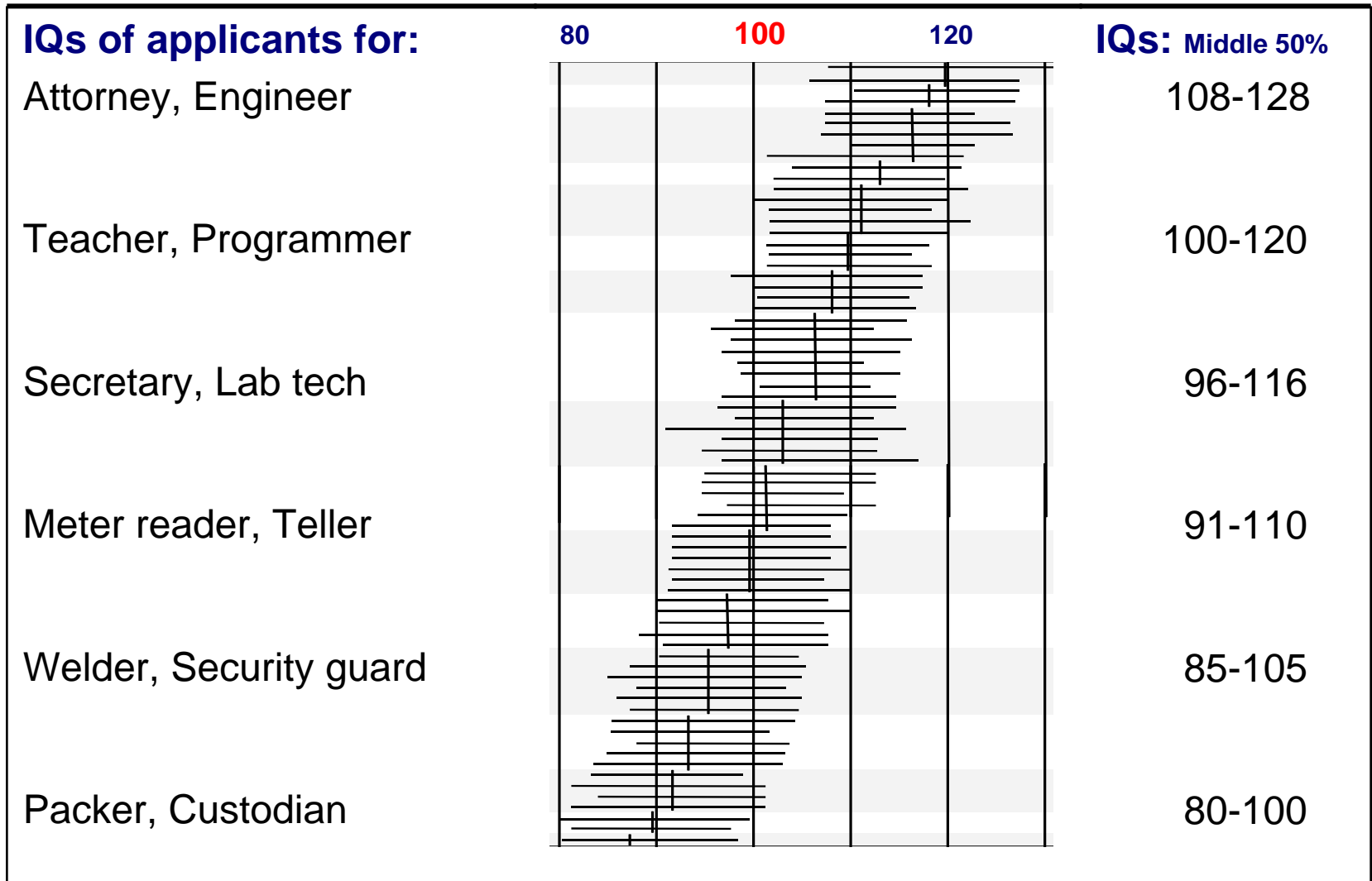
.8



.5



.2



# But Why?

- What is intelligence ( $g$ )?
- What makes a job more complex?



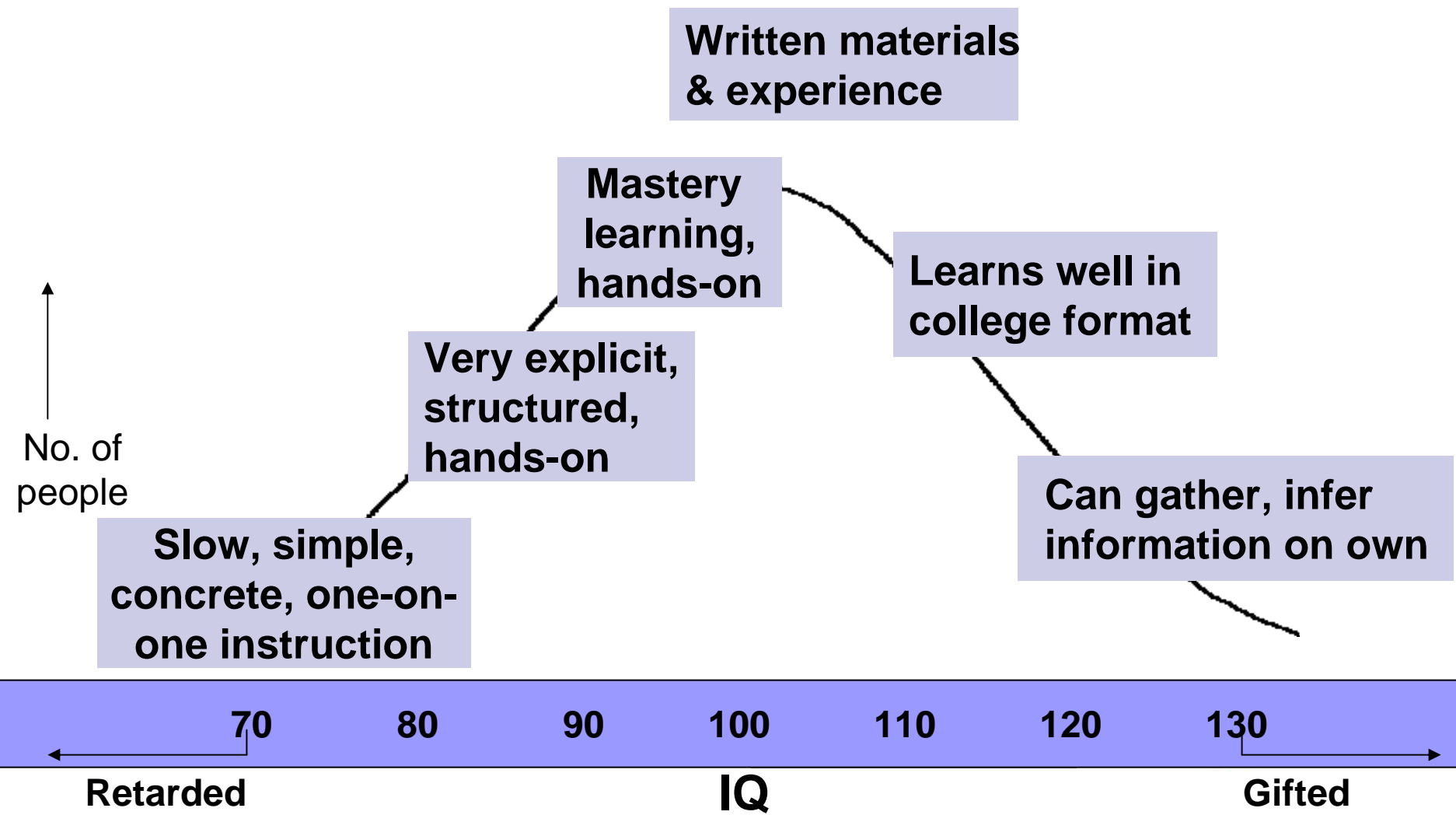
# General Intelligence ( $g$ )


- Ability to reason, plan, spot and solve problems, think abstractly, comprehend complex ideas, learn quickly and from experience.
- Ability to “catch on,” “make sense of things,” and “figure out what to do.”
- Mental “horsepower”

Adept learning and reasoning

# That's Why "Trainability" Differs by IQ

(Results from Wonderlic Personnel Test)



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- What makes a job more complex?

# Common Building Blocks of Task Complexity

## ■ Individual tasks

- ☒ Abstract, unseen processes; cause-effect relations
  - ☐ Incomplete or conflicting information; much information to integrate; relevance unclear
  - ☐ Inferences required; operations not specified
  - ☐ Ambiguous, uncertain, unpredictable conditions
- ☒ Distracting information or events
  - ☐ Problem not obvious, feedback ambiguous, standards change

## ■ Task constellation (Often neglected, even in job analyses)

- ☐ Multi-tasking, prioritizing
- ☐ Sequencing, timing, coordinating
- ☒ Evolving mix of tasks
  - ☐ Little supervision, need for independent judgment

# Complexity Puts a Premium on Independent Learning and Reasoning

(Sample Job Analysis Study)

## Complex jobs require workers to:

(Arvey, 1986)

Correlation with  
overall job  
complexity

(Applied to health)

- Learn and recall relevant information (symptoms) **.75**
- Reason and make judgments (timely preventive care) **.71**
- Deal with unexpected situations (dizziness) **.69**
- Identify problem situations quickly (hazards) **.69**
- React swiftly when unexpected problems occur (injuries, asthma attack) **.67**
- Apply common sense to solve problems **.66**
- Learn new procedures quickly (treatment regimens) **.66**
- Be alert & quick to understand things (feverish child) **.55**

# Good Performance (Adherence) in Job of Diabetes

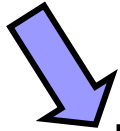
- **IT IS NOT** mechanically following a recipe
- **IT IS** keeping a complex system under control in often unpredictable circumstances
  - ☀ Coordinate a regimen having multiple interacting elements (diet, exercise, etc)
    - Adjust parts as needed to maintain good control of system buffeted by many other factors
  - ☀ Anticipate lag time between (in)action (food, insulin) and system response
  - ☀ Monitor advance “hidden” indicators (blood glucose) to prevent system veering badly out of control
    - Decide appropriate type and timing of corrective action if system veering off-track
    - Monitor/control other shocks to system (infection, emotional stress)
    - Coordinate regimen with other daily activities
  - ☀ Plan ahead (meals, meds, etc.)
    - For the expected
    - For the unexpected and unpredictable

Mirrors cognitive demands of accident prevention and containment

# Cognitive Barriers for Many Diabetics

## ■ Known

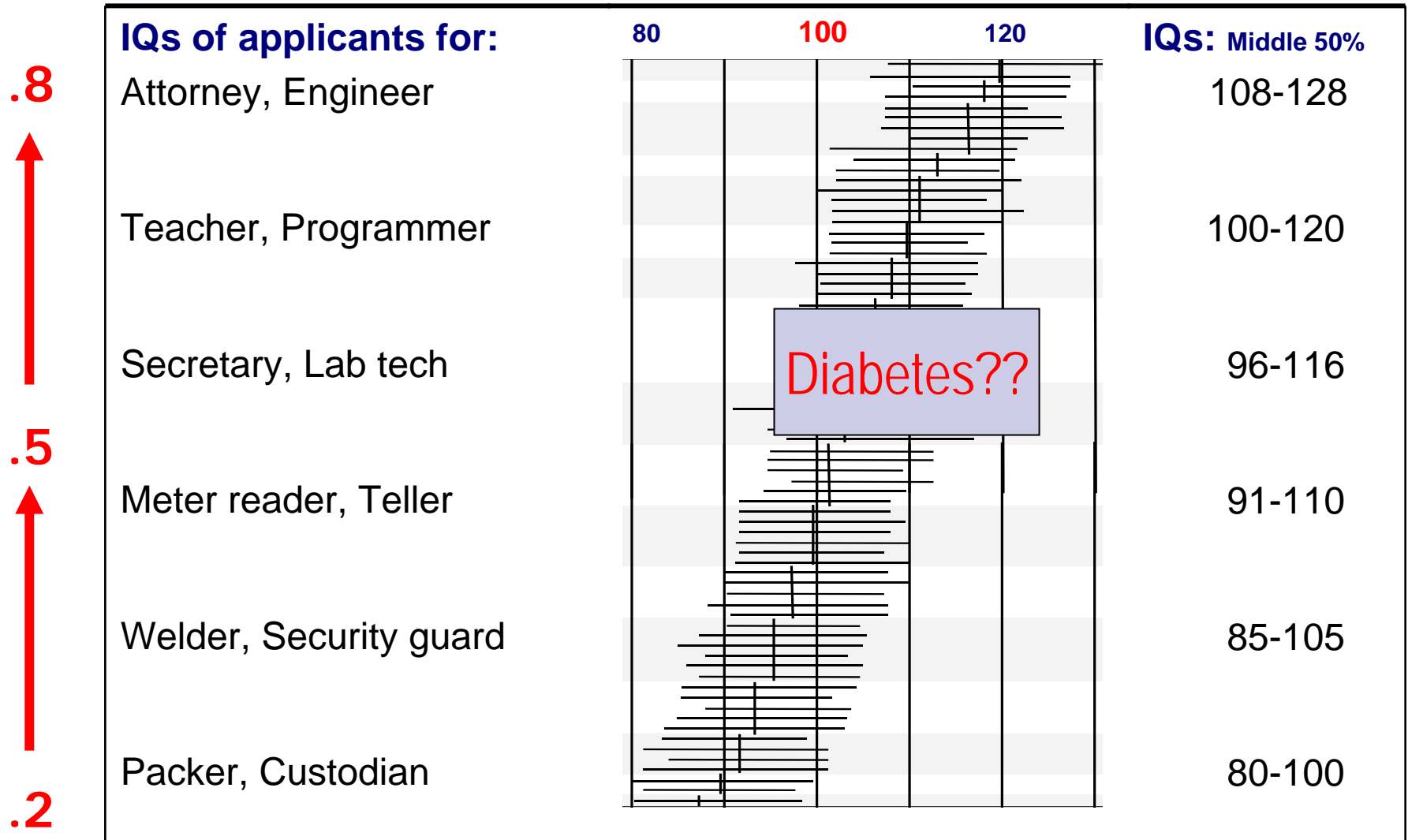
- Abstract concepts in meal planning: carbohydrates (“includes sugar, but not pasta”)
- Immediate costs and benefits are favored over future benefits and costs (cheating on one’s diet, failure to monitor blood glucose)



## ■ Underappreciated

- ☀ Assuming that non-adherence which causes no obvious immediate harm isn’t dangerous (Ketoacidosis from failing to take insulin for several days)
- False security from not grasping abstract concepts of risk, probability, & cumulative damage (“Not planning ahead/not testing myself hasn’t gotten me in trouble, so there is no need for it.”)
- ☀ Not knowing when a deviation is big enough or frequent enough to cause concern (elevated glucose readings)
- Cognitive overload (“It’s too complicated—too much to bother with.”)
- Distrust created when patients don’t understand the limits of medical understanding and advice (“I’m not going to listen to her anymore because the medicine she gave me didn’t work.” Or, “He said he didn’t know if it would work.”)
- ☀ **NOTE: These are not arbitrary “beliefs” that can just be replaced; they are failures to comprehend (“cognitive errors”)**

# We might wonder...





# More Examples of Cognitive Hurdles

## ■ Hypertension

- No outward symptoms
- So treatment is a nuisance without obvious benefits

## ■ Asthma

- Symptoms are obvious, but benefits of the superior drug are not
  - Bronchodilators give immediate but only temporary relief
  - Inhaled steroids don't give fast relief but provide better long-term control

Good health care is never enough: Patients also need the cognitive resources to exploit it effectively.

# The Good News

We know a lot about where and why g matters.

Using this knowledge, we can:

1. Reduce needless complexity
2. Predict where cognitive hurdles will be highest
3. Identify individuals likely to need help surmounting them

# 3 Cognitive Audits To Consider

For particular clinics or chronic diseases, what are the major:

1. Cognitive hurdles in self-care and compliance
  - major/minor, inherent/not
2. Cognitive diversity in patient population
  - “literacy” (average level, spread)
3. Supplementary mental resources available to patients (from family or staff)
  - monitoring, feedback, reminders, hotlines, etc.

Unexplored territory!

# Thank you

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