How Many Chances Should You Get? A Study of Shooting Tests and the Critical Role of Attempt Limits in Maintaining Standards

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Imagine…
the local transport authority announces a new policy

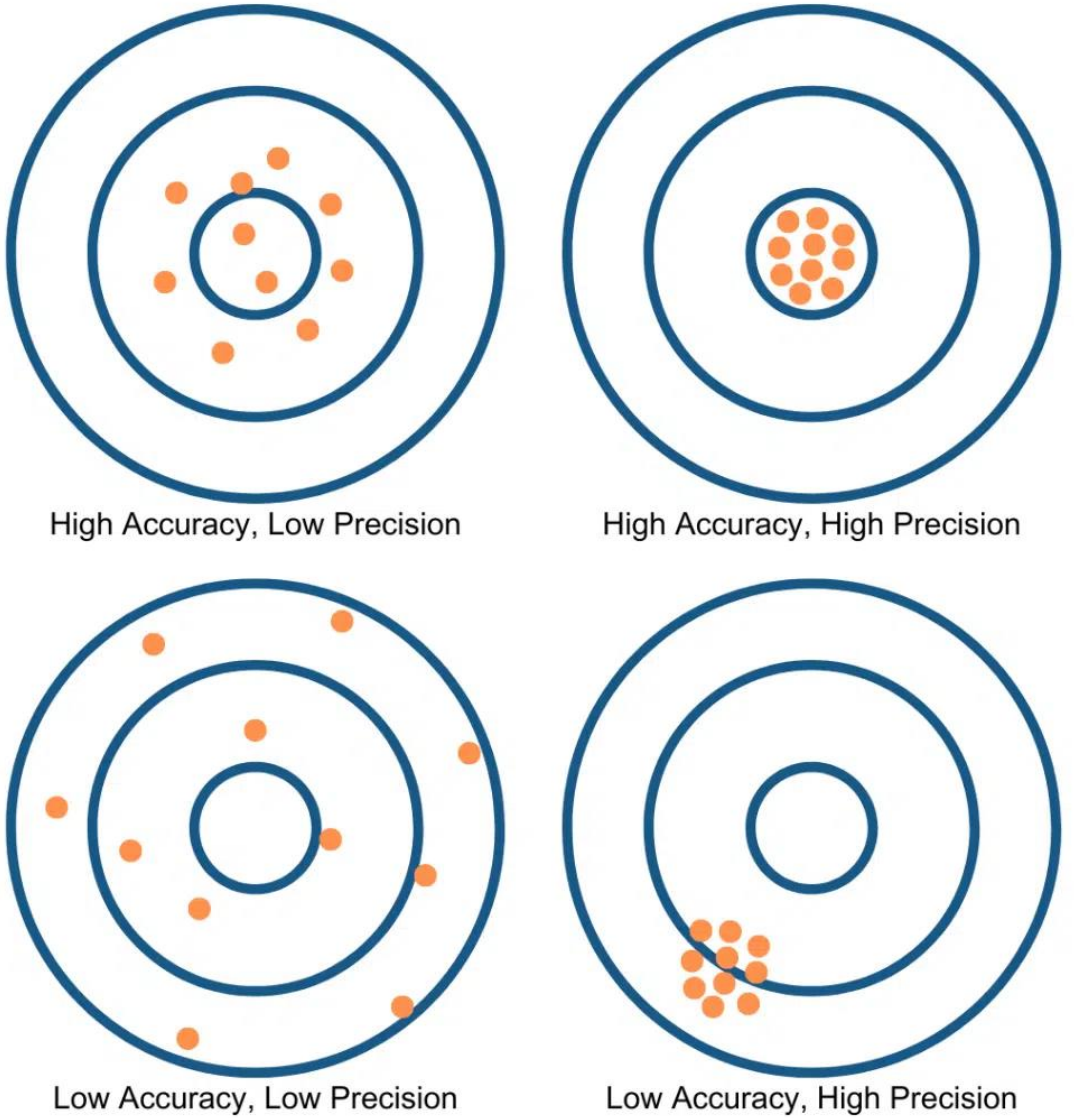
- Student dri
  practical dr
  day
- They pass when they complete just one error-free attempt
- On other attempts, students can
  - Speed
  - Fail to stop at a stop sign
  - Fail to give way
  - Even cause a collision

True competence means consistent, reliable performance under normal conditions

What determines accuracy and precision?

- Accuracy and precision are not the same thing
  - Accuracy measures how close things are to the ‘true’ value (i.e. the bullseye)
  - Precision measures how close they are to one another

- Ideally, shooters are **both accurate and precise**



Animal welfare and public acceptance

- What is the minimum level of accuracy and precision that is acceptable to demonstrate competency?
  - ???
- What other standards are relevant?
  - Minimise suffering, do not cause unnecessary harm
  - 95% rendered unconscious with the first shot (Grandin 2020)
    - This threshold is accepted by animal welfare scientists
- The general public's acceptance is based on a belief that shooters are competent and highly accurate (greater than 95%)

Why is it important?

- Once we have decided to manage a pest animal, we have an ethical responsibility to maintain high standards that consider animal welfare as a priority
- The consequences of inaccurate shooting
  - Animals will escape injured
  - They will suffer unnecessarily before death
- It becomes even more critical for shooters to be competent since wounded animals cannot be followed up on quickly in the field

Current test: Key requirements LLS Annual Firearms Training and Assessment Program (AFTAP)

- Participants get **5 attempts** to pass each activity
- Shots breaking the outer line of target circles count as “in”
  - 4 out of 5 shots “in”
- Must pass **all activities** in their relevant firearm categories to remain authorised
- Serious safety breaches result in immediate loss of firearm access
- Assessment must be completed annually to maintain authorisation

Pass rates and accuracy

4 shots “in” the area from 5, with 5 attempts

- A
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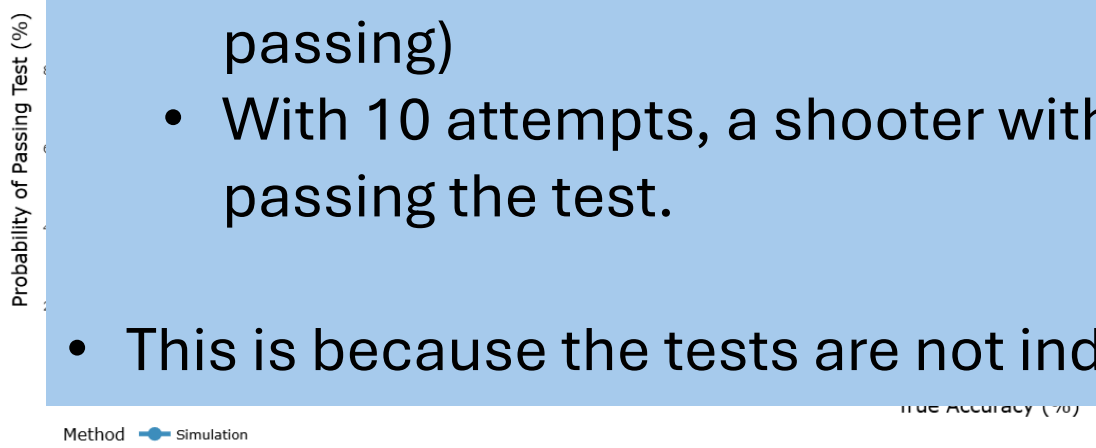
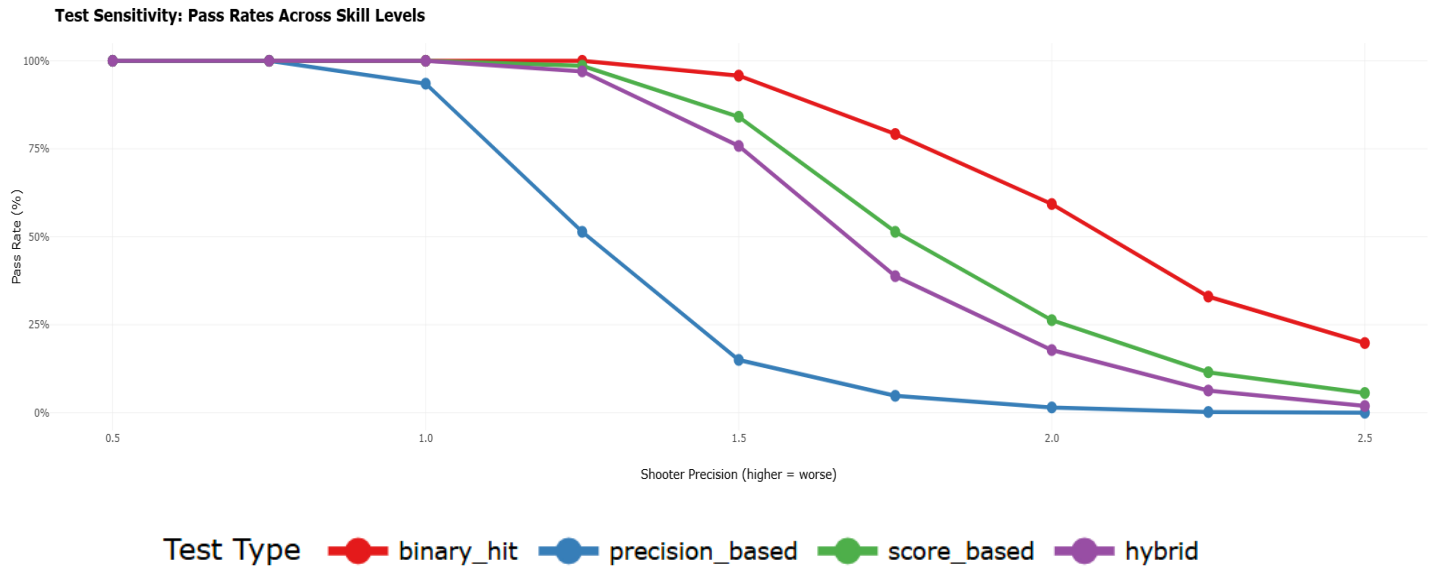
- The number of attempts is a **critical** aspect
- If we take a shooter with 95% true accuracy (4 out of 5 shots in)
  - With one attempt shooter will have a 98% of passing (a shooter with 60% accuracy, 34% pass)
  - With 5 attempts, shooters with 70% accuracy will have a 98% of passing (a shooter with 50% accuracy will have a 65% chance of passing)
  - With 10 attempts, a shooter with 50% will have an 87% chance of passing the test.
- This is because the tests are not independent



Testing competency

- ✕ **Binary Hit/Miss:** Sharp threshold, may be too lenient or strict
- ✕ **Precision-Based:** Rewards tight grouping regardless of accuracy
- ✓ **Score-Based:** Gradual discrimination across skill levels
- ✓ **Hybrid:** Combines multiple criteria for comprehensive assessment

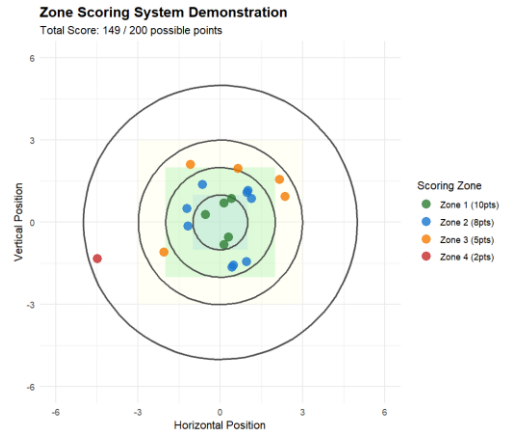


An alternative test:

Five Measurement Approach

Allow 25 shots in total, but use the placement of all shots

1. Mean Radial Distance (MRD): Average distance of shots from group centre (precision only)
2. Circular Error Probable (CEP): Radius containing 50% of shots
3. Extreme Spread: Maximum distance between any two shots
4. Distance from Centre: Measures both accuracy and precision
5. Zone Scoring: Points based on distance from target (10-8-5-2-0)



Conclusion

- Current testing is too lenient and can result in poor welfare if shooters who are not sufficiently competent are allowed to shoot
- The hybrid approach (5 measurement approach) can be achieved quickly and accurately
- Provides feedback to the shooters so that they can improve their proficiency
- Allows demonstration of high shooter proficiency to the public
- **Reduces the suffering of pest animals that are shot**