A comparison of test methods and player perceptions

Dr Colin Young

Loughborough University

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Supported by:
Do current test methods measure “what the players perceive or experience?”

Do current test methods simulate in-game conditions?
Test Method Validation

How can we verify the suitability of test methods?

1. ‘Appropriate’ in-game simulation
2. Classification or benchmarking to previous data
3. ‘Appropriate’ biomechanical simulation
4. Repeatability and reproducibility
5. Compare to player perceptions
Data Collection Methods

Three Significant Sections of Data Collection:

1. In-depth Qualitative Subjective Interviews (N = 22)
2. Quantitative Preference Questionnaires (N = 204)
3. Pitch Specific Questionnaires (N = 87)
Structured Relationship Model
Importance Characteristics

<table>
<thead>
<tr>
<th>Importance Rating (1 = not at all important; 7 = extremely important)</th>
<th>Height of Ball Bounce</th>
<th>Underfoot Grip</th>
<th>Ball Roll Speed</th>
<th>Amount of Ball Spin</th>
<th>Surface Hardness</th>
<th>Ability to Perform Skills</th>
<th>Surface Uniformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.79</td>
<td>5.23</td>
<td>5.65</td>
<td>3.72</td>
<td>4.82</td>
<td>5.80</td>
<td>5.71</td>
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</table>
Players Preferences

<table>
<thead>
<tr>
<th>Feature</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of Ball Bounce</td>
<td>1.87</td>
</tr>
<tr>
<td>Underfoot Grip</td>
<td>4.97</td>
</tr>
<tr>
<td>Ball Roll Speed</td>
<td>6.11</td>
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<tr>
<td>Surface Hardness</td>
<td>3.62</td>
</tr>
</tbody>
</table>

(1 = low, slow or soft & 7 = high, fast or hard)
Ball Rebound Height

Perceived Behaviour vs. Measured Behaviour

Ball Rebound Height

Perceived

Measured

Pitch

A B C D E F

0 7 14 21 28 35 42 49

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Ball Rebound Height
Perceived Ball Rebound Height (1 = low, 7 = high) vs. Measured Ball Rebound Height (cm)

$R^2 = 0.8891$
Underfoot Grip: Pendulum

Measured Linear Coefficient of Friction

Perceived Underfoot Grip (1 = low, 7 = high)
Underfoot Grip: Rotation

Perceived Underfoot Grip (1 = low, 7 = high)

Measured Rotational Traction (Nm)

$R^2 = 0.8506$
Ball Roll Distance

Perceived Surface Pace (1 = slow, 7 = fast)

Measured Ball Roll Distance (m)
Surface Hardness

![Graph showing the relationship between Measured Force Reduction (%) and Perceived Surface Hardness. The graph includes data points and error bars. The R^2 value is 0.9685.](image)

R^2 = 0.9685
Summary

The usefulness of Berlin artificial athlete, ball rebound resilience and rotational traction test equipment/methods to index/classify sports surface have been reinforced by strong correlations with players perceptions.

The appropriateness of ‘ball roll’ and ‘pendulum friction’ tests have been brought into question.