14th World Congress of PERFORMANCE ANALYSIS OF SPORT

ISPAS INTERNATIONAL SOCIETY OF PERFORMANCE ANALYSIS OF SPORT

Middlesex University London

Applied validity and reliability practices within sports performance analysis: Perceptions and practical implications

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The importance of validity and reliability

Serving as the foundation for accurate and actionable insights for coaches, players, and other stakeholders.

Theoretical performance analyst have developed frameworks for establishing KPIs, operational definitions, and data collection systems.

Applied performance analysts often face time constraints and additional barriers that restrict the use of these frameworks.

Addressing the gap

By examining the current practices and perceptions regarding validity and reliability by APAs, we sought to develop a set of ‘best-practice’ recommendations for improving processes.

Survey Design and Distribution

4 key areas: (1) establishing KPI processes, (2) operational definitions processes, (3) familiarisation of systems and (4) reliability processes.

Likert-scale responses on a 6-point scale relating to frequency, multiple-choice responses, and free-text response fields.

Recruitment through social media platforms, emailing and snowballing.

Accessible for 11 weeks (17th July 2023 - 1st October 2023), with periodical social media posts every three weeks

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Insights from 72 Early Career & 103 Experienced Applied Performance Analysts

(n=175)

Age Distribution:

- 18-24 years: Early Career (**48.6%**) vs. Experienced (7.8%)
- 30-34 years: Early Career (4.2%) vs. Experienced (**31.1%**)

Primary Sport:

- Soccer: Early Career (**72.2%**) vs. Experienced (52.4%)
- Rugby: Early Career (6.9%) vs. Experienced (15.4%)

Employment Status:

- Full-Time: Early Career (58.3%) vs. Experienced (**86.4%**)
- Part-Time: Early Career (**37.5%**) vs. Experienced (10.7%)

Academic Qual:

- Masters Degree: Early Career (**65.3%**) vs. Experienced (**68.0%**)

Coaching Qual:

- Level 1 or none: Early Career (**68.0%**)
- Level 2+: Experienced (**52.0%**)

Geographic Distribution:

- UK: Early Career (**53**) vs. Experienced (**72**)
- Oceania Country: Early Career (**3**) vs. Experienced (**9**)

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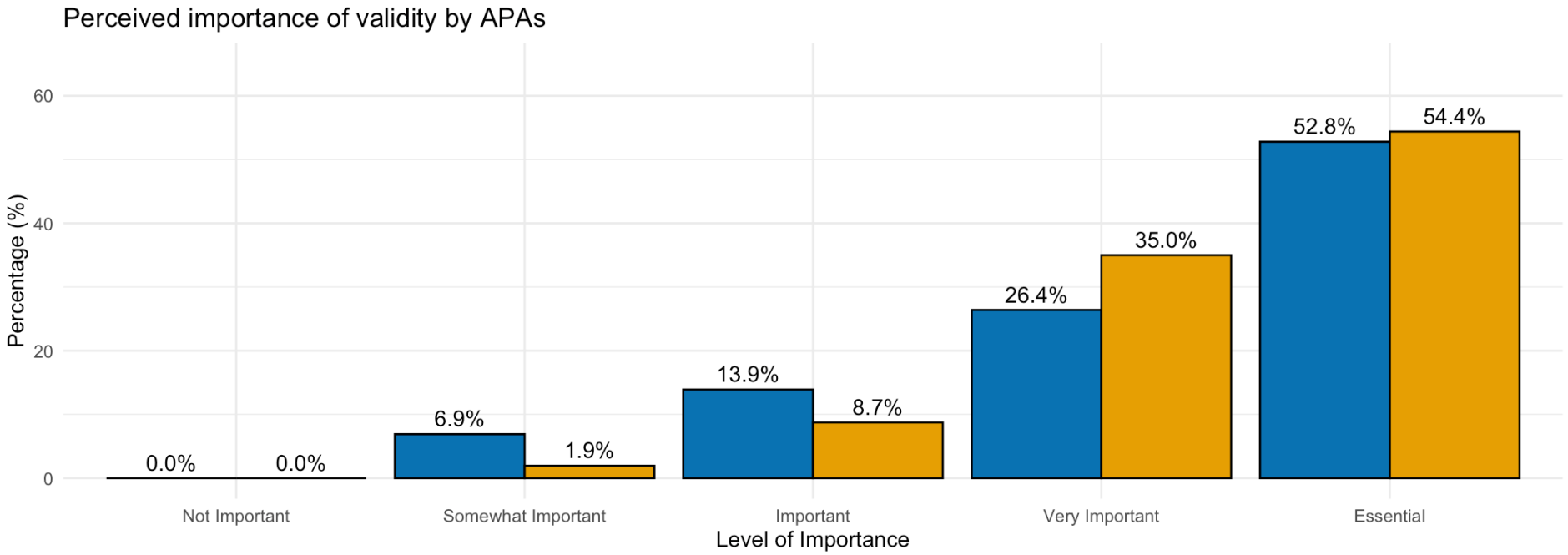

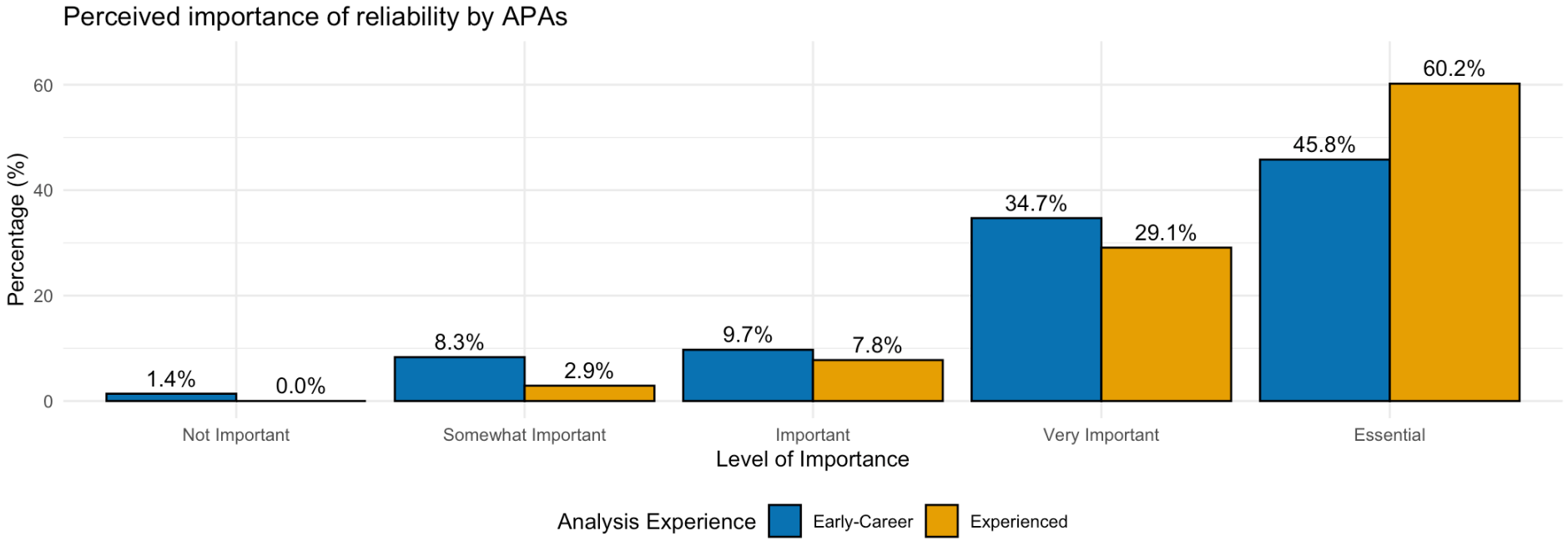

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Key Insights on Validity Decision-Making Practices

Collaborative KPI Decisions: Coaching and Analysis Teams collaborate on primary data/video KPIs, especially in post-analysis for experienced APAs (Experienced **52%** vs Early Career **42.9%**).

Analyst-Driven Live Analysis: Analysts primarily handle live analysis decisions for both primary (55.3%) and secondary (59.2%-68.2%) data/video.

Focus on Key Moments: APAs prioritise key moments (goals, shots, cards) in live analysis, with early-career APAs focusing 37.5% and experienced APAs 35.4% on these moments.

Operational Definitions & Storage: Established by **63.1%-79.0**% of APAs. Experienced APAs align definitions with the playing philosophy more frequently. 70.5% of early-career and 77.9% of experienced APAs using video clips for support.

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Approaches to System Familiarisation

Dedicated Familiarisation Time:

Experienced APAs more frequently dedicate time to familiarise themselves ("Very Frequently" or "Always" at **59.3%-62.1%),** compared to early-career APAs (**36.8%-50.8%**).

Consistency Across Experience Levels:

For secondary data systems, APAs, regardless of experience, generally only set aside time "**Occasionally**" to familiarise themselves with the new data and video.

Varied Familiarisation Approaches:

Time dedicated to familiarisation varies widely, from a **few minutes** to **weeks**, with 16 APAs **not engaging** in any familiarisation at all.

Informal vs. Formal Processes:

A lack of formalised familiarisation processes is common (66 informal practices), with experienced APAs more likely to adopt formal processes. Some APAs engage in "Seeking Confirmation" (n=37) and "Reliability Testing" (n=7) to ensure accuracy.

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Reliability Checking

Reliability Check Frequency: No significant differences by experience; early-career APAs often checked ‘After Each Performance’ (22.7%), while experienced APAs checked ‘In Performance Blocks’ (31.3%).

Quality Check Gaps: **11.1%** of experienced and **13.6%** of early-career APAs did not check primary video/data quality at all; secondary checks were often done ‘In Blocks’ or ‘Never.’

Check Methods: APAs relied on visual checks, discussions, or frequency tables; few used automated systems or statistical tests.

Error Resolution: Approaches to addressing errors varied, from quick fixes like re-analysis (Early-career APA: 18; Experienced APA: 25) to comprehensive strategies such as process identification, definition adjustments, or additional training

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Key Insights and Best Practices for SPA Data Collection and Reliability

Experienced APAs excel in aligning KPIs with team goals, navigating data systems, and ensuring accuracy, thanks to their greater expertise.

Both experienced and early-career APAs need refined operational definitions, and strong reliability checks to ensure KPIs reflect true performance and provide actionable insights.

Time constraints challenge thorough system familiarisation and reliability checks. Streamlining processes and allocating adequate time are crucial for reliable data.

There is variability in familiarisation and reliability practices among APAs. Standardising training and reliability testing methods could improve consistency and accuracy.

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Practical Recommendations: PRECISE

	Validity	Familiarisation	Reliability
P	Promote Collaboration	Practice Sessions	Periodic Manual Checks
R	Rely on Expertise	Regular Feedback	Rely on Automation
E	Employ Video Clips	Exposure Time	Efficient Resolution Process
C	Customise Adaptability	Collaborative Learning	Continuous Cross-Checks
I	Illuminate Definitions	Incremental Learning	Individualised Reliability Standards
S	Synthesise Philosophy	Structured Learning	Systematic Identification of Issues
E	Ensure Effective Software Processes	Comprehensive Guidelines	Enhance with Video

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Thank you for listening, any questions?

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