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## Preliminary Validation of the Athlete Development Formulation Survey (ADFS)

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## Introduction

- Talent development is often measured through anthropometric factors, competition and motor performance tests (Gullich & Cobley, 2017).
- There is evidence that psychosocial factors are important in attaining international medals (Hardy et al., 2017).
- No one has yet compiled psychosocial factors important to athlete development into one practical tool.
- Aim of the study was to develop and undertake preliminary validation of the Athlete Development Formulation Survey (ADFS) using a non-traditional correlational method.

## Method

### Item Generation and Justification

- Initial pool of 190 items was generated from the manuscript of the Great British Medalists Project (Hardy et al., 2017) alongside items from existing questionnaires.
- Items were revised (Rust & Golombok, 2009).
- Two items per construct were generated\* or used from existing measures.

### Instrument Construction

- 1. Life Experiences:** environment of expectation and achievement (EEA)\*; strong work ethic (SWE)\*; highly competitive environment (HCE)\*; mastery focus (MF)\*; and outcome focus (OF)\*.
- 2. Athlete Personality:** difficulty with emotional expression (DWE)\*; counterphobic attitude (CA)\*; need to succeed (NS)\*; need to avoid failure (NAF)\*; selfishness\*; ruthlessness\*; perfectionistic concerns (PC); perfectionistic strivings (PS); socially prescribed perfectionism (SPP); and obsessiveness\*.
- 3. Athlete Behaviours:** mastery focus; outcome focus; total preparation for competition (TPC)\*; commitment to training (CT)\*; and relative importance of sport (RIS)\*.

### Participants

Strongly Disagree    Somewhat Disagree    Neither Agree nor Disagree    Somewhat Agree    Strongly Agree

#### Study 1

- 365 participants were recruited online through social media.

**Life experiences**  $n = 117$  ( $M$  hours training per week = 5.61,  $SD = 4.70$ ;  $M$  years participating in sport = 7.35,  $SD = 7.27$ ). **Personality**  $n = 122$  ( $M$  hours training per week = 6.18,  $SD = 5.29$ ;  $M$  years participating in sport = 7.35,  $SD = 7.27$ ). **Training Behaviours**  $n = 123$  ( $M$  hours training per week = 5.86,  $SD = 5.16$ ;  $M$  years participating in sport = 9.50,  $SD = 7.08$ ).

#### Study 2

- 66 participants ( $M = 30$ ,  $F = 36$ ) recruited in university lectures ( $M$  hours training per week = 7.00,  $SD = 3.37$ ;  $M$  years participating in sport = 7.34,  $SD = 2.84$ ).

### Procedure and Analysis

- Each construct (2 items) were correlated with an existing measure (see results).
- Bivariate and disattenuated correlation, Cook's Distance (Cook, 1977) and attention questions (study 2) were used.
- Magnitude of correlations were reported with effect sizes (Cohen, 1988).

## Results

Table 1. Correlations between ADFS Life Experiences Constructs and Previously Validated Measures

ADFS Variables	WOFO: Mastery		WOFO: Work Ethic		WOFO: Competitiveness		POSQ: Ego		POSQ: Task	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
Environment of expectation and achievement	.51** (1.00)	.37** (.80)								
Strong work ethic			.49** (.63)	.61** (.78)						
Highly competitive environment					.59** (.73)	.49** (.61)				
Outcome Focus							.36** (.46)	.57** (.62)		
Mastery Focus									.19 (.28)	.42** (.68)

Disattenuated correlations are reported in parentheses. Where disattenuated values are greater than 1, it indicates measurement error is not randomly distributed and the value is reported as 1.00. \* indicates  $p < .05$ . \*\* indicates  $p < .01$ . Note: 1 WOFO = Work and Family Orientation Questionnaire (Helmreich & Spence, 1978). POSQ = Perception of Success Questionnaire (Roberts & Balague, 1998).

Table 2. Correlations between ADFS Personality Constructs and Previously Validated Measures

ADFS Variables	1	2	3	4	5	6	7	8	9	10
	Difficulty with Emotion	.40** (1.00)								
Counterphobic Attitude		.34** (.50)								
Need to Succeed			.27** (.41)							
Need to Avoid Failure				.21* (.44)						
Ruthlessness					.25* (.31)					
Selfishness						.36** (.50)				
Perfectionistic Concerns							.64** (.72)			
Perfectionistic Strivings								.54** (.72)		
Socially Prescribed Perfectionism									.58** (.75)	
Obsessiveness										.70** (.92)
Difficulty with Emotion	.46** (.93)									
Counterphobic Attitude		.31* (.49)								
Need to Succeed			.12 (.22)							
Need to Avoid Failure				.14 (.23)						
Ruthlessness					.42** (.52)					
Selfishness						.30** (.39)				
Perfectionistic Concerns							.67** (.74)			
Perfectionistic Strivings								.60** (.76)		
Socially Prescribed Perfectionism									.46** (.65)	
Obsessiveness										.73** (.88)

Note: 1 = Sensation Seeking Emotion Regulation and Agency (SEAS; Barlow et al., 2013); 2 = SEAS: Emotion regulation and agency, whilst participating; 3 = Performance Failure Appraisal Inventory (Conroy et al., 2002); 4 = Manifest Needs Questionnaire (Steers & Braunstein, 1978); 5 = Dirty Dozen (DD; Jonason & Webster, 2010); 6 = Machiavellianism; 7 = Dark Triad; 8 = Multidimensional Inventory of Perfectionism (MIPS; Stoeberl et al., 2006); 9 = Negative Reactions to Imperfection; 10 = MIPS: Striving for Perfection; 11 = Multidimensional Perfectionism Scale (Cox et al., 2002); 12 = Passion Scale (Vallerand et al., 2003); 13 = Obsessive Passion. \* indicates  $p < .05$ . \*\* indicates  $p < .01$ .

Table 3. Correlations between ADFS Athlete Behaviours Constructs and Previously Validated Measures

ADFS Variables	POSQ: Ego		POSQ: Task		QTI		SRSB		IOS	
	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2	Study 1	Study 2
Outcome Focus	-.48** (-.53)	.60** (.68)								
Mastery Focus			-.31** (-.38)	.45** (.62)						
Total Preparation for Competition					.47** (.54)	.50** (.65)				
Commitment to Training							.50** (.60)	.33** (.49)		
Relative Importance of Sport									.39**	.24

Note: POSQ = Perception of Success Questionnaire. QTI = Quality of Training Questionnaire (Woodman et al., 2010). SRSB = Self-Regulated Swim Behaviours (Starkes & Young, 2006). IOS = Inclusion of Others in the Self Scale (Aron et al., 1992). \* indicates  $p < .05$ . \*\* indicates  $p < .01$ .

## Discussion

- Consistent preliminary validation was shown across both studies with increased correlations when measurement error was accounted for.
- Lower strength correlations may be due to non-domain specific measures.
- Further validation is needed within a large elite athlete population across different sports.
- These studies are the first steps toward a practical psychosocial survey to examine important factors known to impact athlete development.
- In applied practice the ADFS could be used as part of multidisciplinary approach to measure and athlete development.

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