

# ARBIS-45: Instrument Development and Enhanced Pilot Validation Protocol

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## Abstract

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The Autonomous Regulation and Boundary Integrity Scale (ARBIS-45) is a 45-item multidimensional self-report instrument designed to assess nine domains of self-regulation, autonomy, and interpersonal boundary functioning. The instrument integrates constructs from Polyvagal Theory, Locus of Control, emotional regulation research, and boundary integrity theory.

The nine domains assessed are: (1) Autonomic & Emotional Regulation, (2) Response Inhibition (Non-Reactivity), (3) Social-Cognitive Pattern Recognition, (4) Documentation Practices, (5) Boundary Integrity, (6) Co-Regulation Capacity, (7) Outcome Detachment, (8) Sustained Regulation Capacity, and (9) Self-Ownership.

This paper presents the finalized item pool, scoring procedures, and an enhanced pilot validation protocol incorporating internal consistency reliability, test–retest reliability, exploratory and confirmatory factor analysis, and convergent and discriminant validity. The ARBIS-45 is intended for research use in resilience, stress adaptation, and autonomy-related psychological functioning.

## 1. Introduction

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### 1.1 Theoretical Background

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Autonomous regulation refers to the capacity to maintain physiological stability, emotional control, and behavioral independence under conditions of stress or external pressure.

This construct draws from:

- Polyvagal Theory — autonomic flexibility and vagal tone
- Locus of Control — internal vs. external control attribution
- Emotional regulation frameworks — modulation of affective responses
- Boundary integrity research — protection of psychological space

While these domains are well-studied independently, no unified instrument integrates them into a single multidimensional framework.

### 1.2 Instrument Objective

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The ARBIS-45 was developed to:

1. Measure nine interrelated domains of regulation and autonomy
2. Provide factor-level and total scores for profiling
3. Enable pre/post intervention assessment
4. Support research on resilience and adaptive functioning

## 2. Instrument Structure

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### 2.1 Factor Model

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<b>Factor</b>	<b>Domain</b>
F1	Autonomic & Emotional Regulation
F2	Response Inhibition
F3	Pattern Recognition
F4	Documentation Practices
F5	Boundary Integrity
F6	Co-Regulation Capacity
F7	Outcome Detachment
F8	Sustained Regulation Capacity
F9	Self-Ownership

Each factor contains 5 items (total = 45 items).

### 2.2 Response Format

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5-point Likert scale:

<b>Score</b>	<b>Label</b>
0	Never
1	Rarely
2	Sometimes
3	Often
4	Always

Timeframe: **Past 30 days**

### 3. Scoring

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<b>Metric</b>	<b>Range</b>
Factor score	0–20
Total score	0–180

### Interpretation (Preliminary)

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<b>Range</b>	<b>Interpretation</b>
0–60	Low regulation/autonomy
61–120	Moderate
121–180	High

### 4. Enhanced Pilot Validation Study

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#### 4.1 Study Design

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<b>Parameter</b>	<b>Specification</b>
Design	Cross-sectional + test–retest subset
Sample size	<b>n = 180–250</b>
Subsample	n ≥ 60 (test–retest)
Age range	18–65
Recruitment	Online + convenience sampling
Duration	~15 minutes

#### 4.2 Measures

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##### Primary Instrument

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ARBIS-45

## Convergent Validity

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Construct	Measure	Expected
Emotional regulation	DERS	Negative
Stress	Perceived Stress Scale	Negative
Resilience	Brief Resilience Scale	Positive
Locus of control	Rotter Scale	Positive

## Discriminant Validity

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Construct	Measure	Expected
Social desirability	Marlowe-Crowne Social Desirability Scale	Weak correlation ( $r \leq .25$ )
Narcissism	Narcissistic Personality Inventory	Weak/negative
Anxiety	GAD-7	Moderate negative

## 5. Statistical Analysis Plan

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### 5.1 Reliability

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Metric	Criterion
Cronbach's alpha	$\geq 0.70$ per factor
Total scale alpha	$\geq 0.85$

### 5.2 Test–Retest Reliability

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- Method: Intraclass Correlation Coefficient (ICC)
- Interval: 2–3 weeks
- Target: **ICC  $\geq 0.70$**

### 5.3 Factor Analysis

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#### Step 1: Exploratory Factor Analysis (EFA)

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- Extraction: Principal Axis Factoring
- Rotation: Oblique (Promax)

## Step 2: Parallel Analysis

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- Determines optimal factor number
- Prevents over-extraction

## Step 3: Confirmatory Factor Analysis (CFA)

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Split sample:

- $n \approx 120$  (EFA)
- $n \approx 120$  (CFA)

## 5.4 Validity Testing

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Type	Method	Criterion
Convergent	Pearson r	$\geq .30$
Discriminant	Pearson r	$\leq .25$
Model fit (CFA)	CFI, TLI, RMSEA	Standard thresholds

## 6. Hypotheses

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- **H1:** ARBIS total positively correlates with resilience ( $r \geq .40$ )
- **H2:** F1 negatively correlates with stress ( $r \leq -.40$ )
- **H3:** F9 positively correlates with internal locus of control ( $r \geq .35$ )
- **H4:** F5 negatively correlates with emotional dysregulation ( $r \leq -.40$ )
- **H5:** ARBIS shows weak correlation with social desirability ( $r \leq .25$ )

## 7. Bias Control

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### 7.1 Social Desirability

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Controlled via inclusion of the Marlowe-Crowne Social Desirability Scale

### 7.2 Common Method Bias

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- Statistical check: Harman's single-factor test
- Design note: Future multi-method validation recommended

## 8. Limitations

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<b>Limitation</b>	<b>Mitigation</b>
Self-report bias	Add behavioral/physiological validation
Cross-sectional design	Longitudinal follow-up planned
Factor inflation risk	Parallel analysis + CFA
Sampling bias	Replication in diverse populations

## 9. Future Directions

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### 9.1 ARBIS-30 Short Form

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Item reduction based on:

- Factor loadings
- Item-total correlations

### 9.2 Longitudinal Validation

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- Stability over time
- Sensitivity to intervention

### 9.3 Physiological Correlates

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- Heart Rate Variability (HRV)
- Cortisol response

### 9.4 Cross-Cultural Validation

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Translation and invariance testing

## 10. Discussion

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### 10.1 Positioning

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The ARBIS-45 is best understood as:

| A multidimensional autonomy and regulation capacity index

It is **not**:

- A diagnostic tool

- A personality inventory

## 10.2 Contribution

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ARBIS-45 extends existing instruments by integrating:

- Behavioral (documentation, boundaries)
- Cognitive (pattern recognition)
- Physiological (regulation)
- Interpersonal (co-regulation)

No existing scale combines these domains into a unified structure.

## 11. Conclusion

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The ARBIS-45 provides a structured, multidimensional assessment of regulation, autonomy, and boundary integrity. The enhanced pilot validation protocol incorporates reliability testing, factor validation, and bias controls necessary for rigorous psychometric evaluation.

Pending empirical validation, the instrument has potential applications in:

- Psychological research
- Resilience studies
- Intervention assessment

## 12. References (Selected)

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## Comments

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