The 'Optimal Shirt Sizing Protocol' (OSP)

The OSP is a pro-grade diagnostic tool that scientifically determines a user's **Target Measurement Profile (TMP)** by calculating personalized ease ratios based on their body, style goals, and fabric characteristics.

Precision Policy: Body inputs $\mathbf{= 1 \text{ dp}}$; Ratios (CER/HER/WTR) $\mathbf{= 2 \text{ dp}}$; TMP outputs $\mathbf{= 1 \text{ dp}}$; Units toggle $\mathbf{[\text{ in } | \text{ cm }]}$.

📝 Phase 1: Define the Research (The Goal & Controls)

Component	Description	Your Input
Central Problem Entity	Inconsistent sizing causing **Fit Friction** (FFS).	
Primary Objective	To determine your personalized **Preferred Ease Ratios (PERs)**.	
Body Measurements (Controls)	**A** Chest/Bust, **B** Waist, **C** Hip ($\mathbf{1 \text{ dp}}$)	$\text{A: } \mathbf{X.X}$

Input Quality Checks	Description
Validity	$\text{A} \ge \text{B}$ and $\text{A} \ge \text{C}$.
Human Range	$\text{Chest } \mathbf{28–60 \text{ in}}$, $\text{Waist } \mathbf{24–56 \text{ in}}$, $\text{Hip } \mathbf{28–62 \text{

	in}}$ ($\text{auto-convert to cm}$).
Data Alert	**Missing-data alert: ON. Duplicate-entry alert: ON.**

⚙️ Phase 2: Isolate & Control Variables (Test Ratios & Fabric Mapping)

Variable Category	Ratio Name	Formula	Guardrail Range	Fabric Stretch Guardrails
Independent Var. 1	**Chest Ease Ratio (CER)**	$\text{CER} = \frac{\text{Shirt Chest}}{\text{Body Chest (A)}}$	$\mathbf{1.02} \text{ to } \mathbf{1.25}$	**None:** 1.05–1.12 $\mid$ **Low:** 1.03–1.10 $\mid$ **High:** 1.02–1.08
Independent Var. 2	**Hip Ease Ratio (HER)**	$\text{HER} = \frac{\text{Shirt Hip}}{\text{Body Hip (C)}}$	$\mathbf{1.02} \text{ to } \mathbf{1.10}$	
Independent Var. 3	**Waist Taper Ratio (WTR)**	$\text{WTR} = \frac{\text{Shirt Waist}}{\text{Shirt Hip}}$	$\mathbf{0.70} \text{ to } \mathbf{1.10}$	**None:** 0.86–0.96 $\mid$ **Low:** 0.84–0.94 $\mid$ **High:** 0.80–0.92

📊 Phase 3: Mandate a Quantitative Data Log (The Data Sheet)

Log data for $\mathbf{5}$ shirts, focusing on your primary style goals. Calculated ratios must be $\mathbf{2 \text{ dp}}$.

ID	Style Goal	Stretch	Shirt Chest	Shirt Hip	Shirt Waist	Calculated CER	Calculated HER	Calculated WTR	FFS (1-10)	Reference Markers (Yoke, Sleeve, Length)
S1										

🔬 Phase 4: Guide a Quantitative Analysis (The Personalized TMP)

Score Model: Fit Friction Score (FFS) 1–10 — $\mathbf{\text{lower } = \text{ better}}$. **Liked $\mathbf{= \text{FFS} \le 3}$**.

Statistical Rigor Rules:

- **Per-Style Minimum:** Before averaging PERs, require $\mathbf{\ge 2 \text{ Liked shirts (FFS} \le 3)}$ in each style bucket.
- **Outliers:** Exclude observations outside $\mathbf{\text{Q}1 - 1.5 \times \text{IQR}}$ or $\mathbf{\text{Q}3 + 1.5 \times \text{IQR}}$.
- **Fallback if Liked $\mathbf{< 2}$:** Use the $\mathbf{\text{median}}$ of all valid candidates for that style or $\mathbf{\text{collect more data}}$.

Step 1 & 2: Calculate PERs. For each Style Goal with ≥ 2 Liked Shirts, calculate the **Average Ideal Ratio** (A-Ratio).

Style Goal	Liked Shirts Count (FFS≤3)	Avg. Ideal CER (ACER)	Avg. Ideal HER (AHER)	Avg. Ideal WTR (AWTR)
Formal				

Insight Statement: "For my **[Style Goal]**, the data suggests my ideal $\mathbf{A}_{\text{CER}}$ is $\mathbf{X.XX}$, $\mathbf{A}_{\text{HER}}$ is

$\mathbf{Y.YY}$, and $\mathbf{A}_{\text{WTR}}$ is $\mathbf{Z.ZZ}$."

✅ Phase 5: Conclude with a Testable Hypothesis (The Solution)

Use your $\mathbf{A}_{\text{Ratios}}$ to define your **Target Measurement Profile (TMP)**.

TMP Formulas (Outputs are 1 dp)	**Tie-Break Logic**
$\text{Target Chest} = \text{A} \times \mathbf{A}_{\text{CER}}$	**Prioritize CER** for mobility ($\mathbf{\text{keep } \ge 1.02}$).
$\text{Target Hip} = \text{C} \times \mathbf{A}_{\text{HER}}$	$\text{Then adjust } \mathbf{WTR}$ within the $\mathbf{0.70–1.10}$ guardrail to recover silhouette.
$\text{Target Waist} = \text{Target Hip} \times \mathbf{A}_{\text{WTR}}$	

Hypothesis: "My hypothesis is that any new shirt meeting my TMP will achieve an $\mathbf{\text{FFS} < 2}$."

Validation Rule: The protocol $\mathbf{\text{succeeds}}$ if **$\mathbf{\ge 2 \text{ of } 3}$** (or $\mathbf{\ge 3 \text{ of } 5}$) new shirts from the $\mathbf{\text{same brand or fabric family}}$ achieve $\mathbf{\text{FFS} \le 2}$.

Re-validation Triggers: $\mathbf{\text{Re-test TMP}}$ after any of the following: brand/collection change, $\mathbf{\ge 5\%}$ body-weight change, or $\mathbf{\text{laundering shrink/stretch}}$.