

The "Weave vs. Weight" Isolation Test

♦ 1 Phase 1: The Research Protocol

- **Central Problem Entity:** Premature fabric-to-skin adhesion and rising thermal discomfort in dry heat.
- **Problem Statement:** A measurable difference in time-to-stick may occur between shirts that vary in weave openness and fabric weight under matched dry-heat exposure.
- **Primary Objective:** To determine whether weave openness or GSM weight has the greater effect on delaying skin adhesion in dry heat conditions.

♦ 2 Phase 2: Variable Identification

- **Independent Variables (The Suspects):**
 - *Weave Openness:* Determines how easily air can move through the fabric structure and how quickly heat and moisture can dissipate.
 - *Fabric Weight (GSM):* Influences fabric mass, drape, moisture handling, and the rate at which the cloth collapses onto the skin.
- **Confounding Variables (Strict Controls):** To ensure clean data, control the following variables across all trials:
 - *Fiber content* must remain constant (e.g., 100% cotton for all test shirts).
 - *Fit category* must remain similar across garments to prevent trapped air variances.
 - *Test time* must be matched within the same hour window (e.g., 2:00 PM - 3:00 PM).
 - *Walking pace/activity level* must remain identical.
 - *Exposure duration and route* must remain the same.
 - *Sun Exposure Condition:* Keep direct sun vs. shade exposure consistent across all trials.
 - *Observation Zone:* Always judge stick point from the exact same body zone (e.g., upper back / shoulder blade area only).
 - *Undershirt status* must be identical (either none, or the exact same brand/material).
 - *Shirt color* should remain similar (avoid testing a white shirt against a navy shirt).
 - *Hydration and pre-test rest* should be standardized.

♦ 3 Phase 3: The Quantitative Data Log

- **Operational Definition of the Event:**
 - *Stick Point:* The first moment when the shirt fabric begins to cling to the upper back or shoulder blade area and no longer moves freely with normal shoulder motion.
- **The Data Collection Table:**

Trial #	Date	Shirt ID	Fiber	Weave	GSM	Temp	Humidity	Exp. / Sun	TTS (Min)	Fit	Notes
1	Aug 2	Blue Poplin	100% Cotton	Tight	95	90°	35%	Block Walk / Full Sun	12	Slim	Felt heavy immediately
2	Aug 3	White Hopsack	100% Cotton	Open	140	92°	32%	Block Walk / Full Sun	28	Slim	Breeze penetrated fabric

◆ 4 Phase 4: Quantitative Analysis

- **The 2x2 Isolation Matrix:** Segment the logged data into four distinct clusters:
 1. Tight Weave + Low GSM
 2. Tight Weave + High GSM
 3. Open Weave + Low GSM
 4. Open Weave + High GSM
- **The Calculation:** Calculate the average Time to Stick (TTS) for each of the four clusters.
- **Insight Statement:** By cross-referencing the averages, the true driver is revealed.
 "The data shows that my *Open Weave + High GSM* cluster delayed the stick point by an average of 16 minutes compared to the *Tight Weave + Low GSM* cluster, isolating weave openness as the dominant variable over raw fabric mass."

◆ 5 Phase 5: The Testable Hypothesis

- **The Hypothesis Structure:** "My hypothesis is that, under matched dry-heat conditions, my open-weave shirts will delay the stick point by at least 10 minutes compared with my tight-weave shirts, regardless of whether the open-weave garment has a slightly higher GSM."
- **The Next Action:** Design a strict A/B test for the upcoming week: Test shirts across all four matrix clusters and compare the average TTS of each cluster before modifying the wardrobe.

