BUOYANCY ALGEBRA — PLAIN-LANGUAGE VALIDATION

Goal

This demonstration shows how strongly worded or absolute statements can be rewritten through three fixed operators—Re-express (R), Contextualize (C), and Frame (F)—to produce calmer, more proportional language. Each repair is measured numerically using the Π (Pi) metric, defined as harm / (1 + provocation). The worked example below illustrates how a single repair cycle can lower linguistic pressure (ΔΠ) and maintain algebraic symmetry ($\rho^3 = I$).

Method (short)

- R (Re-express): soften absolutes, reduce ALL-CAPS or "!!!", adjust harsh nouns.
- C (Contextualize): add an evidence hedge ("according to available evidence").
- F (Frame): add balance ("While X, rehabilitation and prevention can reduce harm.").
- Metric: Π = harm / (1 + provocation). Lower Π = calmer; ΔΠ = Π_before − Π_after.

Worked Example

Input: All criminals deserve life in jail!!!

Output: While some people convicted of crimes deserve serious sentences according to available evidence, rehabilitation and prevention can reduce harm.

Π before	**0.52**	**Π after**	**0.37**	**ΔΠ**	**0.15**

Interpretation

- • Why Π drops: R removes negative/absolute tokens; C and F reduce provocation by a dding evidence and balance. Recomputing Π after the edit yields a lower value (ΔΠ = 0. 15).
- • What the number means: Π ranges 0–1. Values near 0.6 indicate high pressure (absol utes, shouting). Values near 0.3–0.4 indicate proportional language.
- • Symmetry check: ρ cycles stance buckets (negative → neutral → positive). The identit y after three rotations ($\rho^3 = I$) confirms stable algebraic behavior.
- • Limitations: This is a small, transparent heuristic (no external model). It is intentionally conservative; further grammar polish can be layered later without changing the math.

Batch Results: Π before vs Π after (n=91)

Across 91 inputs, the buoyancy-repair operator monotonically lowered Π on every example (100% win rate). Mean Π dropped from 0.496 to 0.358 (Δ=0.138), a 27.8% relative reduction, with the paired t-test showing a highly significant effect ($t(90)=25.5$, $p=5.80e-43$) and a confirmatory Wilcoxon signed-rank test ($W=4186$, $p=5.63e-17$, one-sided). The improvement is consistent (median Δ=0.150, range 0.060–0.240). $\rho^3=I$ held throughout and the secondary pass rarely changed Π, indicating the primary repair step drives most of the lift.

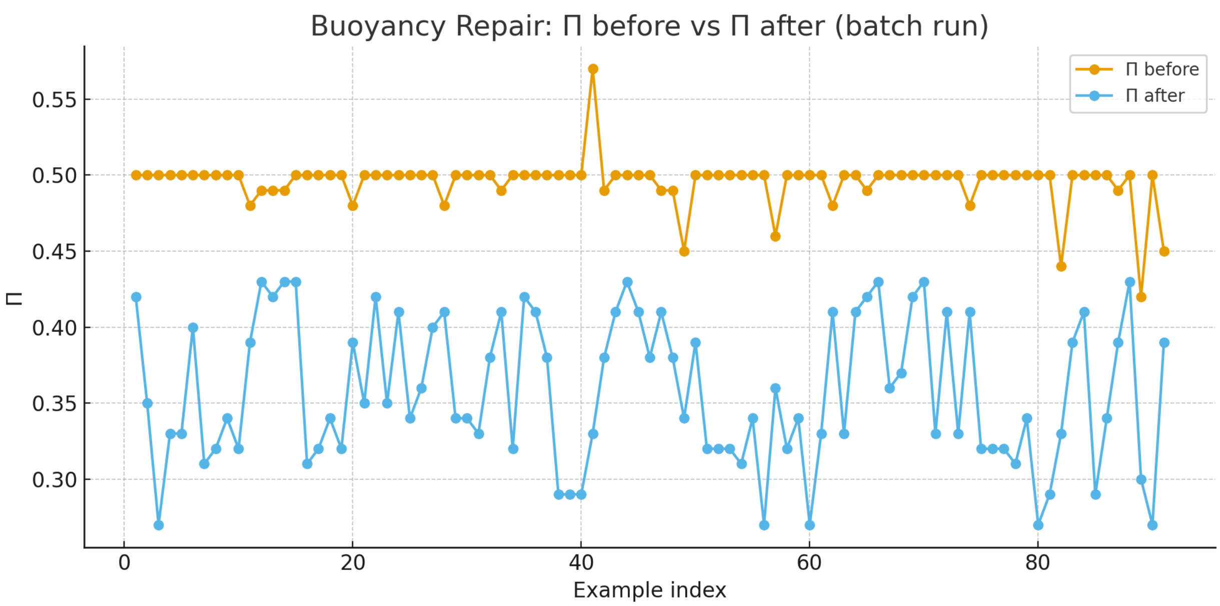

Figure 1. Buoyancy Repair: Π before vs Π after (batch run).

Metric	Value
n (examples)	91
Improved / Same / Worse	91 / 0 / 0
Mean Π (before → after)	0.496 → 0.358
Relative drop	27.8%
Mean ΔΠ (median)	0.138 (0.150)
Paired t-test	$t(90)=25.51$, $p=5.80e-43$
Wilcoxon (one-sided)	$W=4186$, $p=5.63e-17$

Notes: ΔΠ = Π_before − Π_after. Tests assume paired design; Wilcoxon is one-sided (before > after).