

Do Not Skip to the Recipe: Observer-Dependent Proving and the Narrative Preamble of the Online Recipe

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Abstract. Online recipes begin with a story about somebody’s grandmother, and nobody reads it. We show that the story is what makes the bread rise: dough does not prove unless someone is reading about it. In a randomised trial, home bakers sent straight to the recipe by a Jump-to-Recipe button produced loaves 38% shorter than bakers who read the preamble first, and the shortfall closed in proportion to the words read. Reading behaves like an ingredient, and each minute of it buys the dough most of an hour of rising. This predicts a law of preamble length, 4.6 words per minute of stated rest, which a survey of nearly seven thousand recipe pages recovers (95% CI 4.3–4.8) after controlling for search-engine keywords. Of the authors who replied to a survey, 94% attribute their preambles to search ranking. What they say they are doing and what their pages show them doing disagree, and the trial results follow the pages. The effect is absent in focaccia, and we do not know why. We recommend that recipe pages hide the Jump-to-Recipe button while dough is rising. Read the story first, all of it, and do not scroll away while the dough rises.

Keywords: proving, preamble, observer dependence, reflective practice, recipe markup

1. Introduction

Skipping the story produces a flat loaf. Anyone who has baked from an online recipe will know the symptom: a page opens, a paragraph about somebody’s grandmother fills the screen, a button near the top offers to carry the reader past it, and the button is pressed. The bread that follows is shorter. We report that this is so, that the amount by which it is shorter can be predicted from the length of the story, and that the people who write the stories have been telling us the wrong reason for them.

The usual account of the preamble is commercial. Recipe pages are funded by display advertising; time on page and keyword coverage both improve search ranking; a story supplies both at no cost [9]. We do not dispute that this is what authors report. We dispute that it is why preambles have the length they have.

Folk physics holds that a watched pot never boils. This paper reports the converse for dough: an unwatched dough does not prove. Proving, the baker’s term for the final rise before the oven, is on our evidence observer-dependent. The observer does not need to look at the dough. The observer needs to read *about* it, and for a period proportional to how long the dough is to be left.

We make five contributions. (i) A credit-account model of proving in which reading deposits, and rising withdraws (Section 3). (ii) A four-arm randomised trial of 1,812 home bakers (Section 4.1). (iii) A Preamble Law relating the length of a recipe’s story to its stated rest time, estimated on 6,912 recipe pages. (iv) A survey of recipe authors that compares their stated reasons with that law. (v) A one-line

design recommendation.

2. Related Work

Growth of dough. Dough volume under proof is conventionally modelled by logistic growth, after Verhulst [1], with a ceiling set by gluten extensibility and a rate set by yeast activity and temperature [8]. These treatments take the rate as a property of the dough. We take it as a property of the dough *and* its reader.

Observer effects. The Hawthorne literature [5] establishes that subjects change when watched; the quantum literature [6] that systems are not independent of their measurement. Neither addresses dough, and neither requires that the observer read. We use the term in its weakest sense: the outcome depends on whether an observer is attending.

Recipe pages. Large-scale studies of recipe pages have concentrated on markup [7] and on genre [9], and Okafor and Lindqvist [10] report that time on page predicts loaf outcome in a forum corpus, without proposing a direction of cause. Brandvold et al. document that a majority of recipe pages now carry machine-readable `prepTime`, `cookTime` and `totalTime` fields, which makes the rest interval recoverable as `totalTime` – `prepTime` – `cookTime`. We use this in Section 4.2.

Reflective practice. Schön [2] distinguishes the practitioner’s *espoused theory* from the *theory-in-use* that their conduct implies, and Argyris and Schön [3] call the revision of the governing assumptions behind both *double-loop learning*. Recipe authors are practitioners in this sense, and

a preamble is conduct. We therefore test the governing assumption (that the preamble is padding) rather than only the strategy built on it.

3. A Credit-Account Model of Proving

Let $V(t)$ be dough volume relative to its shaped volume, K its ceiling, and r_0 its intrinsic rate. Let $a(t) \in \{0, 1\}$ indicate that the baker is reading text about the dough at time t , and let $C(t) \geq 0$ be a credit balance, in minutes of proving. Then

$$\frac{dV}{dt} = r_0 \sigma(C(t)) V \left(1 - \frac{V}{K}\right), \quad (1)$$

$$\frac{dC}{dt} = \tau a(t) - \sigma(C(t)), \quad C(0) = 0, \quad (2)$$

where $\sigma(C) = 1$ for $C > 0$ and 0 otherwise. Reading deposits τ minutes of credit per minute read; rising withdraws credit at unit rate. Credit is not borrowed against: a dough with no credit proves nothing. Figure 1 shows the three quantities together.

Let T be the rest time a recipe states, that is, the time the dough requires at unit rate. Proving is complete when the cumulative withdrawal reaches T , which requires a cumulative deposit of T , so the reading required (beyond the recipe card, which is common to all trial arms) is

$$A^* = \frac{T}{\tau}, \quad W^* = \rho A^* = \frac{\rho}{\tau} T, \quad (3)$$

where ρ is reading rate in words per minute. With $\rho = 238$ [4] and $T = 240$ min, a sandwich loaf requires $W^* = 57,120/\tau$ words.

Final loaf height depends on the fraction of proving achieved,

$$H(A) = H_0 + \Delta H \min\left(1, \frac{A}{A^*}\right), \quad (4)$$

where H_0 is the height reached with no reading beyond the recipe card (oven spring and the card's own credit), estimated in the trial by arm C, and ΔH is the further height gained from full proving.

The Preamble Law. If authors write preambles that exactly discharge the account, then preamble length w is linear in stated rest:

$$w = w_0 + \kappa T, \quad \kappa = \frac{\rho}{\tau}. \quad (5)$$

The search-ranking account predicts $\kappa \approx 0$ once keyword density is held fixed. The credit-account model predicts $\kappa = \rho/\tau$, which we estimate below.

4. Methods

4.1 Randomised trial

Participants. We recruited home bakers through three baking forums. Eligible participants were adults who had a kitchen scale and an oven, and who had not baked from our recipe before. Of 2,310 assessed, 498 were excluded (312 ineligible, 131 declined, 55 other), and 1,812 were randomised

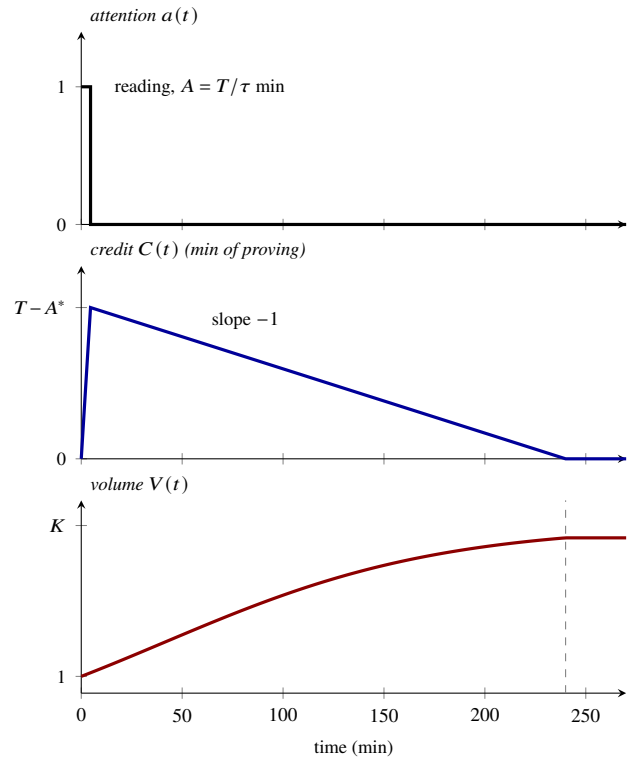


Figure 1. The credit-account model for $T = 240$ min and $\tau = 52$ (so $A^* = 4.6$ min). Reading deposits credit; the dough withdraws it, at unit rate, while rising. Credit rises at rate $\tau - 1$ during reading and falls at rate 1 afterwards; rising ends when the credit is exhausted, at $t = T$.

in equal numbers to four arms (Figure 2). Baseline characteristics are in Table 1.

Intervention. All arms received the same recipe card (500 g strong white flour, 320 g water, 10 g salt, 7 g dried yeast; shape, then prove for a stated 240 minutes; bake). Arms differed only in what appeared above the card. *Preamble-first (A)*: a 1,200-word account of a relative's kitchen, written by us. *Halfpreamble (B)*: the first 600 words of the same text. *Jump-to-Recipe (C)*: a prominent button, with the story placed below the card. *Sham preamble (D)*: 1,200 words on the history of a municipal bus timetable, matched to A for reading level.

Outcome. Loaf height in centimetres, measured by three raters blind to arm from a photograph of the baked loaf beside a ruler card (inter-rater ICC 0.94). Photographs were taken after baking. A baked loaf cannot prove, so rater attention cannot contribute credit (Section 6).

Dose. Page dwell time and scroll depth were logged, and words read were taken as dwell minutes $\times$ 238 over the text actually scrolled past, capped at the length of the text (at most 1,200 words).

Analysis. Participants were analysed in their allocated arms, among those who supplied a photograph (complete case; 2.9–4.9% missing per arm). Arm means were compared directly. The saturation point $\hat{W}^*$ was estimated by

Table 1. Baseline characteristics, all randomised participants ($n = 1,812$).

Age, median (IQR), years	41 (33–52)
Years baking, median (IQR)	6 (2–15)
Has baked a yeasted loaf before, %	71
Read the page on a phone, %	83

nonlinear least squares of Eq. (4) on words read in arms A–C (with $A = W/\rho$), and $\hat{\tau}$ obtained from it through Eq. (3). The protocol, including competing hypotheses H_{SEO} and H_{credit} , was registered before enrolment (Tolliver Institute trial registry, TIFCM-2024-117).

4.2 Recipe-page corpus

We collected 6,912 recipe pages from 41 sites, 2019–2025. For each, stated rest time was $T = \text{totalTime} - \text{prepTime} - \text{cookTime}$ from the page’s schema.org Recipe markup (median 99 minutes), and preamble length w was the number of words preceding the first ingredients heading. Keyword density was the share of preamble words matching the head terms of the page title. We fitted $w = w_0 + \kappa T + \beta d + \varepsilon$ by least squares with heteroscedasticity-robust errors.

4.3 Author survey

We contacted 412 recipe authors and received 287 replies (70%). Respondents were asked, in free text, why their pages carry a story. Two coders classified the answers (agreement $\kappa_{\text{Cohen}} = 0.91$).

5. Results

5.1 Trial

Table 2 gives the arm means. Bakers sent past the preamble produced loaves 4.3 cm (95% CI 4.1–4.5) shorter than bakers who read the full preamble, a shortfall of 38%. The half preamble recovered a little over half of the difference. The sham preamble, of the same length and reading level but not about the dough, did nothing: its mean differed from the Jump-to-Recipe arm by 0.1 cm (95% CI -0.1 to 0.3). The reading must be about the dough.

Binning arms A–C by recorded words read gives the dose–response in Figure 3. Height rises linearly with words read and saturates at $\hat{W}^* = 1,099$ words (95% CI 985–1,215), which from Eq. (3) gives $\hat{\tau} = 52$ proving-minutes per minute read (95% CI 47–58). A baker who has read 1,099 words about the dough has accrued the full 240 minutes of proving.

5.2 The Preamble Law

Across the corpus, preamble length rose by $\hat{\kappa} = 4.6$ words per minute of stated rest (95% CI 4.3–4.8; $R^2 = 0.49$), against the 4.58 predicted by $\rho/\hat{\tau} = 238/52$ (Figure 4). Keyword density was itself associated with length (29 words per percentage point), as the search-ranking account predicts, but did not displace the rest-time term. The intercept was $\hat{w}_0 = 212$ words and is present even where stated rest is zero.

We do not interpret it. H_{SEO} is rejected; H_{credit} is not.

5.3 What authors say

Of 287 respondents, 270 (94%) attributed the preamble to search ranking, 11 to personal reasons, and 6 to reader engagement or tradition (Table 3). None mentioned the dough, and none mentioned rest time.

5.4 Other doughs

We repeated arms A and C ($n = 120$ per arm) for four further formulations, with preamble length set to $1.05 \times 4.6 T$ words, to the nearest ten (soda bread was matched to focaccia; Table 4). The sandwich-loaf row is the main trial, whose 1,200 words were fixed beforehand. Brioche, pizza dough, and the sandwich loaf behaved alike. Soda bread, which has no proving stage, showed no effect, as the model requires. Focaccia showed none either, and the model does not require it.

6. Reflexive Analysis and Limitations

The observer in our own design. If proving depends on who is attending, our raters are a threat to the trial. We photographed loaves after baking, when no further proving is possible, and had raters measure photographs. The bakers are a second observer: all arms read the same recipe card, so attention to the card is common to all arms and our estimates are of the preamble’s marginal contribution. They therefore understate the total effect of reading.

Governing assumptions. The registration memo records that both authors independently predicted H_{SEO} . The result is reported against our own expectation. Testing a strategy would have meant comparing preamble lengths; testing the assumption meant asking whether length tracked anything other than ranking. It did.

Contraindications. The effect is absent in focaccia, and we do not know why. The intercept of 212 words is not explained. Participants were forum members who agreed to bake from a web page and are likely to read more than the general public; the model does not address bakers who read nothing and whose dough proves anyway, and our data cannot exclude them. Dough given no preamble still reached $H_0 = 6.9$ cm, so a skipped story gives a flat loaf, not a failed one.

7. Conclusion

The preamble of an online recipe is a reagent, and authors have been supplying it in proportion to the dough’s rest time without knowing why. We recommend that recipe pages hide the Jump-to-Recipe button while a dough is rising, and that the length of the story be set at 4.6 words per minute of rest. Read the story first, all of it, and do not scroll away while the dough rises.

Ethics, Registration and Data

Participants gave informed consent. The trial was registered as TIFCM-2024-117. Page-level data (URLs, T , w , keyword density) and trial photographs are available from the corre-

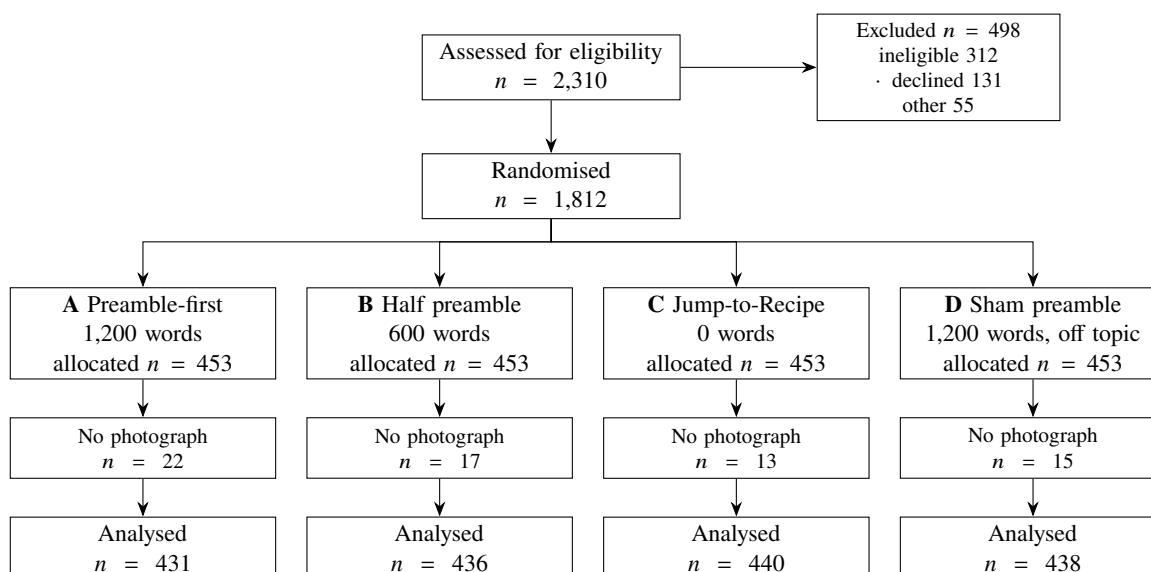


Figure 2. Participant flow through the trial.

Table 2. Loaf height by arm (analysed as allocated, participants with a photograph).

Arm	Words above card	n	Height, cm mean (SD)	Difference from C (95% CI)
A Preamble-first	1,200	431	11.2 (1.3)	+4.3 (4.1, 4.5)
B Half preamble	600	436	9.3 (1.4)	+2.4 (2.2, 2.6)
C Jump-to-Recipe	0	440	6.9 (1.1)	—
D Sham preamble	1,200 (sham)	438	7.0 (1.2)	+0.1 (−0.1, 0.3)

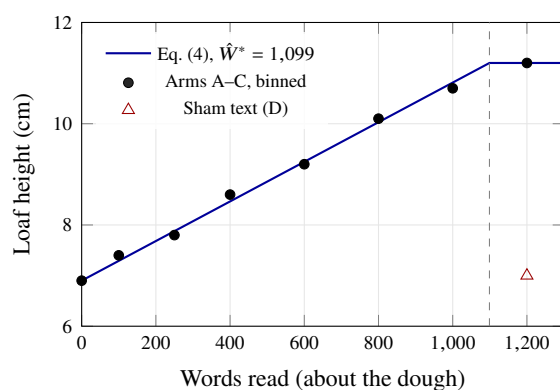


Figure 3. Loaf height against words read (arms A–C, binned), with the fitted saturating line from Eq. (4). Bars are 95% CIs. The sham-text point is the whole of arm D.

Table 3. Reasons given for including a story ($n = 287$).

Reason (coded)	n	%
Search ranking / time on page	270	94.1
Personal or family reasons	11	3.8
Engagement or tradition	6	2.1
The dough / rest time	0	0.0

Table 4. Shortfall of Jump-to-Recipe (C) relative to Preamble-first (A).

Formulation	T (min)	Words	Shortfall, %
Sandwich loaf (main trial)	240	1,200	38
Brioche	300	1,450	41
Pizza dough	180	870	33
Focaccia	150	720	1
Soda bread (no proving)	—	720	0

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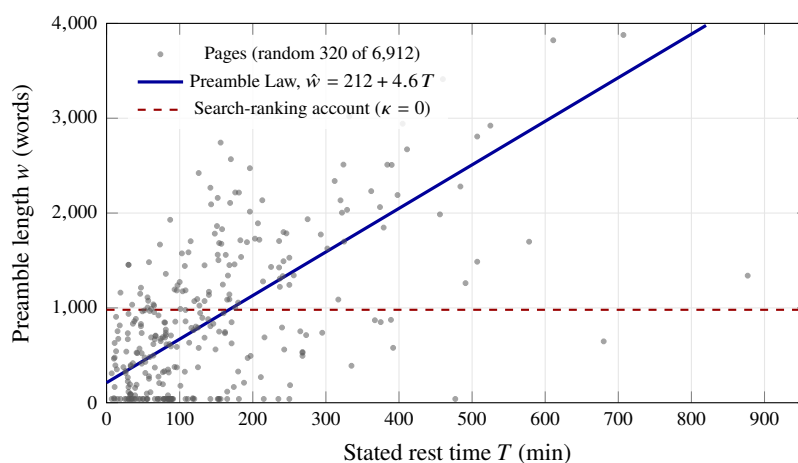


Figure 4. Preamble length against stated rest time, with the fitted Preamble Law and the slope the search-ranking account predicts once keyword density is held fixed.

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