

Years and Dollars

Longevity, the Black–White Wealth Gap, Stress Spending, and the Design of Stress-Aware Money

The Understanding Company

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Abstract

Wealth and longevity are bound together in both directions. Wealth buys time: in the United States the life-expectancy gap between the richest and poorest 1% by income is 14.6 years for men and 10.1 years for women, and losing three-quarters or more of one’s net worth in later middle age is associated with a 50% higher hazard of death. Time builds wealth: savings compound only over years lived, retirement income is paid only while one survives, and every premature death is a shock to a household. Using the 2024 U.S. life tables, we trace how the Black–White survival gap enters the racial wealth gap. Life expectancy at birth was 74.8 years for non-Hispanic Black and 78.9 for non-Hispanic White Americans, and 79% of the difference arises from deaths before 65. A Black 22-year-old has a 75.2% chance of reaching 67 (White: 82.7%) and can expect 14% fewer years of retirement; for equal earnings, expected retirement-only Social Security benefits per payroll-tax dollar are 12% lower (17% for men), a shortfall that disability and survivor benefits offset for the group as a whole. A Black couple aged 30 has a 42% chance of losing a partner before 67 (White: 31%). The purely compositional effect of shorter lives, by contrast, is about 1.5% of the log wealth gap. Shorter lives amplify and transmit the wealth gap more than they cause it, and both gaps share an upstream driver in chronic stress. The same forces widen other gaps: women live longer on less, Hispanic Americans’ longevity outruns their savings, American Indian and Alaska Native people have the shortest lives, and disability, mental illness, gambling, penalty fees, and values-based exclusion drain wealth where buffers are thinnest. We review evidence that sadness, sleep loss, scarcity, and poor mental health move spending; explain why The Understanding Company exists; describe the Understanding engine, an explainable system that links each purchase to its receipt, shipment, and on-device health signals and acts before the next purchase; and commit to an evaluation and ethics protocol.

Keywords: longevity; wealth; racial wealth gap; life tables; Social Security; disability-free life expectancy; stress spending; heart rate variability; commitment devices; explainable models

1 Introduction

Personal finance keeps one ledger and medicine keeps another. The first counts dollars; the second counts years. This paper argues that they are a single ledger, and that its most consequential entries are written in the decades between leaving school and reaching retirement.

The link runs in both directions. Wealth buys time. Across the U.S. income distribution, higher income is associated with longer life at every percentile [1]; in middle and later life, wealth predicts death and disability more strongly than income, education, or occupation [2, 3]; and a sudden collapse in wealth is followed by a sharp rise in mortality [4]. Time, in turn, builds wealth. Savings compound only over the years a saver lives, retirement income arrives only while a retiree survives, and a death in the household removes an earner, imposes costs, and often forces the sale of assets.

Both directions bear on the largest and most persistent economic disparity in the United States, the gap in wealth between Black and White households. In 2022 the typical White family held \$285,000 in net worth and the typical Black family \$44,900 [5, 6]. On a per capita basis the White-to-Black wealth ratio is about six to one; convergence stalled after 1950, and the gap has widened again since the 1980s as capital gains have mainly benefited White households [7]. Black Americans also live shorter lives: in 2024, life expectancy at birth was 74.8 years for the non-Hispanic Black population and 78.9 for the non-Hispanic White population [8]. It is natural to ask how much of the first gap the second explains. The answer depends on the channel, and the honest summary is: a small share directly, a larger share through the channels that matter most to families, and more still because the two gaps feed each other.

We make six contributions. First, we synthesize the evidence on the two-way relationship between wealth and longevity (Section 2). Second, we use the 2024 life tables to locate the Black-White survival gap by age and to quantify four channels through which it reaches wealth: the age composition of the population, the annuity structure of retirement income, the loss of partners within households, and the length of working lives (Section 3). Third, we review what the evidence says about the quality of the later years, which wealth shapes as much as their number (Section 4). Fourth, we review the behavioral and physiological evidence on stress spending, the everyday mechanism through which strain becomes debt and debt becomes strain (Section 5). Fifth, we extend the analysis to other wealth gaps the same mechanisms widen: those of women, Hispanic Americans, American Indian and Alaska Native people, people with disabilities or mental health conditions, and households harmed by gambling, penalty fees, or exclusion on grounds of their values (Section 6). Sixth, we explain why The Understanding Company exists (Section 7), describe the Understanding engine behind our product, Vueni (Section 8), and commit to an evaluation and ethics protocol (Section 9). Section 10 sets out limitations.

A note on terms. “Black” and “White” refer to the non-Hispanic Black and non-Hispanic White populations as classified by the National Center for Health Statistics and the Survey of Consumer Finances. Racial differences in survival and wealth reflect differences in conditions, opportunities, and exposures, not biology [7, 9]. The Understanding engine does not use race, ethnicity, gender, disability, or any proxy for them.

2 Longevity and wealth: a two-way street

2.1 Wealth buys time

The income gradient in U.S. mortality is steep and continuous. Linking 1.4 billion person-year tax records to death records, Chetty and colleagues found that life expectancy rises with income throughout the distribution; the gap between the richest and poorest 1% was 14.6 years for men

and 10.1 years for women in 2001–2014, and it widened over the period [1]. The National Academies projected that men born in 1960 who reach 50 can expect to live to about 89 if they are in the top fifth of earners and to about 76 if they are in the bottom fifth, a gap of more than 12 years, up from about 5 years for men born in 1930 [10].

Wealth is an even sharper predictor than income in middle and later life, because it measures accumulated security rather than a single year’s flow. In the Midlife in the United States cohort, the mortality disparity by wealth was larger than the disparities by education, occupation, income, or childhood socioeconomic status: after age 65, adults with no assets had an estimated 40% chance of surviving to 85, against 71% for those with at least \$300,000 (in 1995 dollars), a difference that narrowed to 51% versus 70% after full adjustment for confounders [2]. In the Health and Retirement Study, Americans aged 54–64 in the lowest wealth quintile had a 17% risk of death and a 48% risk of disability over ten years, against 5% and 15% in the highest quintile [3]. The gradient is unusually steep in the United States: among 73,838 adults aged 50–85 in American and European cohorts, survival in the wealthiest American quartile was similar to survival in the poorest quartile of northern and western Europe [11].

Changes in wealth matter as well as levels. Among Americans aged 51–61 at entry to the Health and Retirement Study, a negative wealth shock, defined as losing 75% or more of net worth over two years, was associated with an adjusted hazard ratio for death of 1.50, and asset poverty at baseline with 1.67; death rates were 64.9 per 1,000 person-years after a shock against 30.6 for those whose wealth stayed positive [4].

Several mechanisms carry wealth into survival: access to care, healthier housing and neighborhoods, the ability to absorb a shock without forgoing treatment, food, or rent, and relief from the physiological cost of chronic insecurity. McEwen’s account of allostatic load describes how the stress mediators that protect the body in the short run damage it when they are activated chronically [12]. Financial insecurity is a textbook chronic stressor.

2.2 Time builds wealth

The reverse direction is stated less often, but it is just as mechanical. Wealth is a stock accumulated from flows over time: earnings saved, returns compounded, debts repaid. Each additional working year adds a year of earnings and contributions, and each additional year of life lengthens the horizon over which assets compound. Retirement income in the United States is dominated by an annuity, Social Security, which pays only while the beneficiary lives. Because lifespans have grown faster for high earners, the National Academies projected that men born in 1960 in the top earnings bracket will receive \$132,000 more in lifetime benefits from the major entitlement programs than men in the bottom bracket [10].

Health shocks that precede death are also wealth shocks. Three years after a hospital admission, insured adults admitted at ages 50–59 were 11 percentage points (15%) less likely to be employed and earned \$9,000 a year less (20% of their prior earnings), a loss far larger than the \$1,400 annual rise in their out-of-pocket medical spending [13]. Deaths impose further costs on survivors: lost earnings, funeral expenses, caregiving time, and, often, the sale of a home or business to settle an estate.

History shows how large the time channel can be. Karger and Wray estimate that the average White man born in 1900 earned 2.6 times as much over his lifetime as the average Black man, nearly twice the cross-sectional earnings gap, because 48% of Black men born in 1900 died before age 30, against 26% of White men. Convergence in mortality halved the Black–White welfare gap between the 1900 and 1920 birth cohorts; for cohorts born between 1920 and 1970, the gap stagnated as differences in income and life expectancy remained large [14].

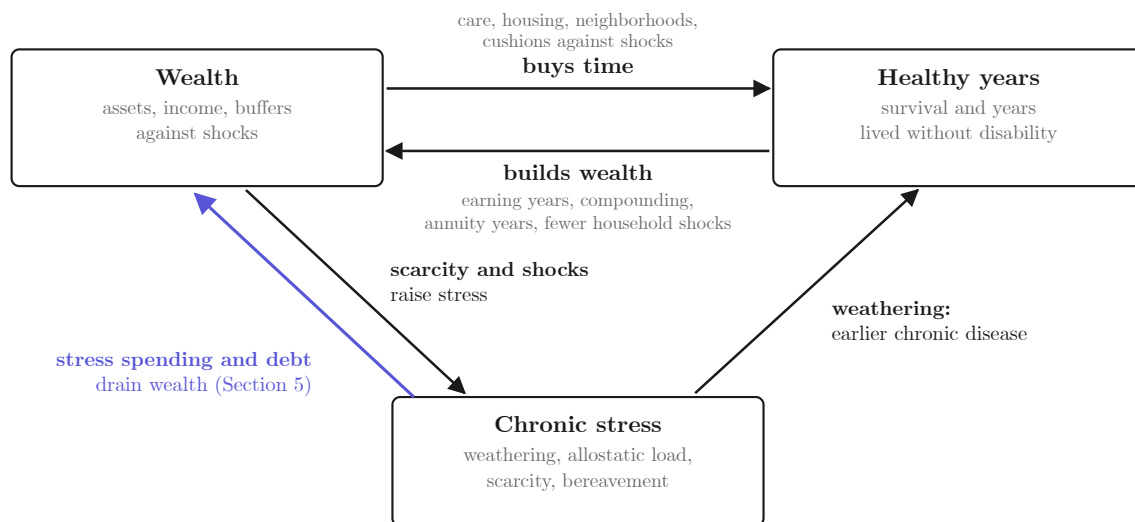


Figure 1. Wealth and healthy years reinforce each other, and chronic stress erodes both. Section 2 reviews the two upper arrows, Section 3 quantifies the “builds wealth” arrow for the Black–White gap, and Section 5 reviews stress spending (in color), the everyday path from stress to debt that our product addresses.

3 The racial wealth gap and the lifespan gap

3.1 Two gaps

Wealth. The 2022 Survey of Consumer Finances put median net worth at \$285,000 for White families and \$44,900 for Black families; mean net worth was \$1,367,200 and \$211,500 [5]. The typical Black family thus held 15.8% of the wealth of the typical White family. The gap’s origins are historical and structural: vastly different starting conditions after Emancipation [7]; exclusion from mortgage credit and homeownership, including through the 1930s Home Owners’ Loan Corporation maps, which reduced homeownership, house values, and rents and increased racial segregation in the affected neighborhoods for decades [15]; and continuing disparities in income, returns, and access to credit. Differences in individual choices such as education, saving, or financial literacy do not close it [16]. Family transfers sustain it. In the 2019 survey, 29.9% of White families had received an inheritance or gift, against 10.1% of Black families; 17.1% versus 6.0% expected one; 71.9% versus 40.9% could get \$3,000 from family or friends in an emergency; and among middle-aged families, 65% of White and 44% of Black families held a retirement account [17].

Lifespan. In 2024, life expectancy at birth was 74.8 years for the non-Hispanic Black population and 78.9 for the non-Hispanic White population, a gap of 4.2 years. The gap was 5.4 years for men (71.3 versus 76.7) and 3.1 for women (78.2 versus 81.3) [8]. Table 1 summarizes the quantities used below; all are computed from the complete 2024 period life tables.

Table 1. Survival in 2024, non-Hispanic White and Black populations, from the complete period life tables [8]. Years lived are life-table person-years per person alive at 22 (T_{67}/l_{22} and $(T_{22} - T_{67})/l_{22}$).

	White	Black	White men	Black men	White women	Black women
Life expectancy at birth (years)	78.9	74.8	76.7	71.3	81.3	78.2
Life expectancy at 65 (years)	19.5	18.3	18.2	16.5	20.6	19.8
Alive at 65, share of birth cohort	84.1%	76.4%	80.6%	70.7%	87.7%	82.1%
Reach 67, share of 22-year-olds	82.7%	75.2%	79.0%	69.1%	86.6%	81.1%
Reach 85, share of 22-year-olds	43.5%	35.4%	37.1%	27.1%	49.9%	43.1%
Die between 22 and 65	15.1%	21.7%	18.4%	27.3%	11.6%	16.4%
Years lived at 67+, per 22-year-old	14.9	12.8	13.3	10.6	16.5	14.9
Years lived at 22–66, per 22-year-old	42.8	41.6	42.2	40.5	43.4	42.6

3.2 Where the survival gap arises

Figure 2 plots survivors by age. The curves separate early and widen through middle age. By 65, 84.1% of a White birth cohort is still alive against 76.4% of a Black cohort, and half of each cohort has died by about age 83 and 79 respectively. After 65 the remaining difference is comparatively small: a Black 65-year-old can expect 18.3 more years and a White 65-year-old 19.5, a difference of 1.1 years.

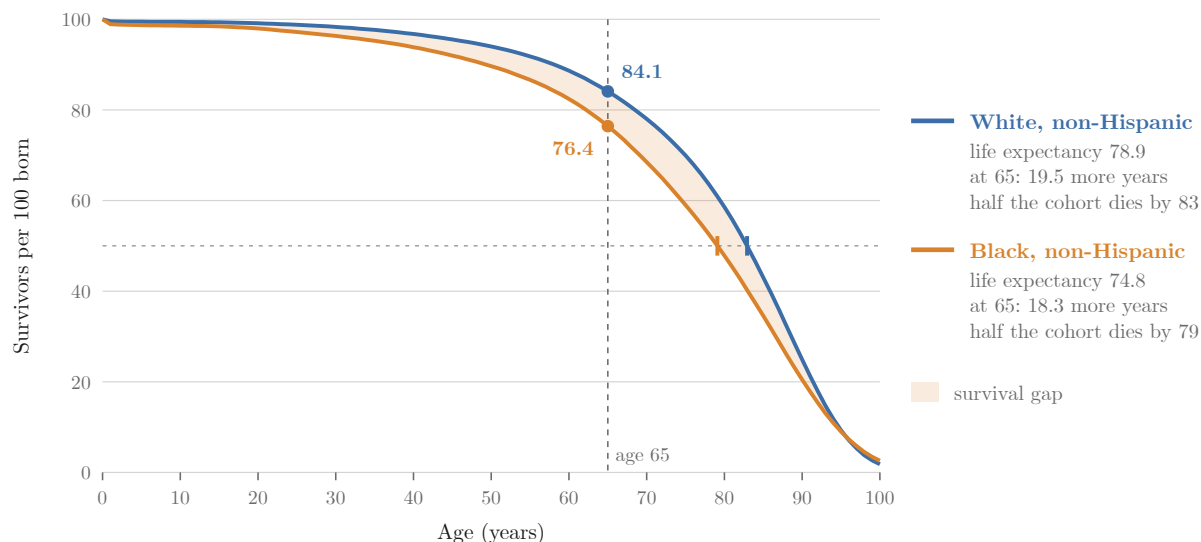


Figure 2. Survivors per 100 born, non-Hispanic White and Black populations, from the 2024 period life tables [8]. The shaded area is the survival gap. Values at 65 are the share of each birth cohort still alive; ticks on the dotted line mark the age by which half the cohort has died.

To locate the gap precisely, we decompose the difference in life expectancy at birth by age at death using the method of Arriaga [18]. For single years of age x , with survivors l_x , person-years lived L_x , and person-years remaining T_x , and superscripts B and W for the two populations, the contribution of deaths at age x to $e_0^W - e_0^B$ is

$$\Delta_x = \frac{l_x^B}{l_0} \left(\frac{L_x^W}{l_x^W} - \frac{L_x^B}{l_x^B} \right) + \frac{T_{x+1}^W}{l_0} \left(\frac{l_x^B}{l_x^W} - \frac{l_{x+1}^B}{l_{x+1}^W} \right), \quad (1)$$

with the open age interval at 100 handled by a single term. The contributions sum exactly to the gap. Of the 4.16-year difference, 3.3 years (79%) arise from deaths before age 65 and 2.3 years (56%) from deaths at working ages, 22–64 (Figure 3). Deaths at 45–64 alone contribute 1.27 years (31%); infant deaths contribute 0.52 years. Above 85 the contribution is slightly negative (−0.17 years), because the Black Americans who reach very old ages have slightly lower death rates at those ages than White Americans do.

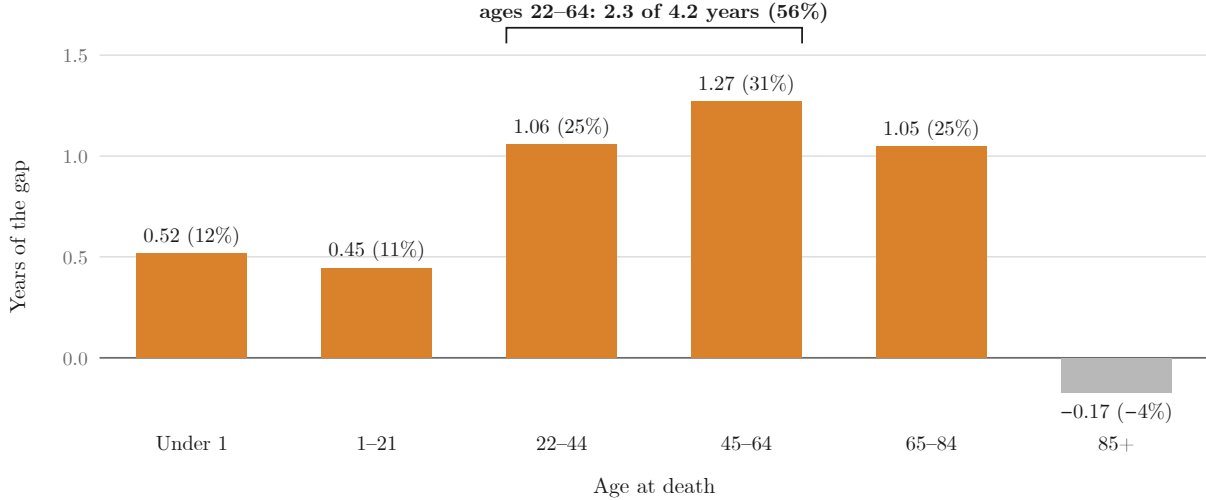


Figure 3. Contributions of deaths at each age to the 4.16-year gap in life expectancy at birth between the non-Hispanic White and Black populations in 2024, by the Arriaga decomposition (Equation 1). Percentages are shares of the total gap.

This age pattern is the signature of what Geronimus called weathering: the cumulative physiological toll of chronic social and economic adversity, which ages bodies early [19]. In national data, Black adults had higher allostatic load scores than White adults at all ages, most of all at 35–64, and the difference was not explained by poverty [9]. Wealth is part of the story: in the Health and Retirement Study, the far lower asset holdings of Black adults affected not only their financial well-being but their survival, independent of income and education [20], and among young adults unsecured debt had more severe health consequences for Black than for White respondents [21]. Bereavement compounds the burden: Black Americans are significantly more likely than White Americans to lose a mother, a father, and a sibling from childhood through midlife, and a child or a spouse from young adulthood on [22].

3.3 How shorter lives reach wealth

We now ask how the survival differences in Table 1 enter wealth when everything else is held equal. Each calculation gives both populations identical earnings, saving, returns, and benefit rules and lets only survival differ. These are accounting exercises, not causal estimates. Their purpose is to bound how much of the wealth gap the survival gap can carry through each channel.

Channel 1: age composition. Wealth rises with age into the late sixties (Figure 4A). A population whose members die younger has fewer adults at the ages when wealth peaks. To isolate this effect, we weight the 2022 age-wealth profile of all U.S. families, $w(a)$ [5], by each population’s adult person-years:

$$\bar{W}_g = \frac{\sum_{a \geq 22} w(a) L_a^g}{\sum_{a \geq 22} L_a^g}. \quad (2)$$

Because Black survival is lower, Black adult person-years tilt toward younger ages (Figure 4B), and the age-standardized wealth index is 2.5% lower using median wealth by age and 2.8% lower using mean wealth by age. Against the observed median ratio of 15.8%, this is 1.4% of the log gap with medians and 1.5% with means. The compositional channel is real but small.

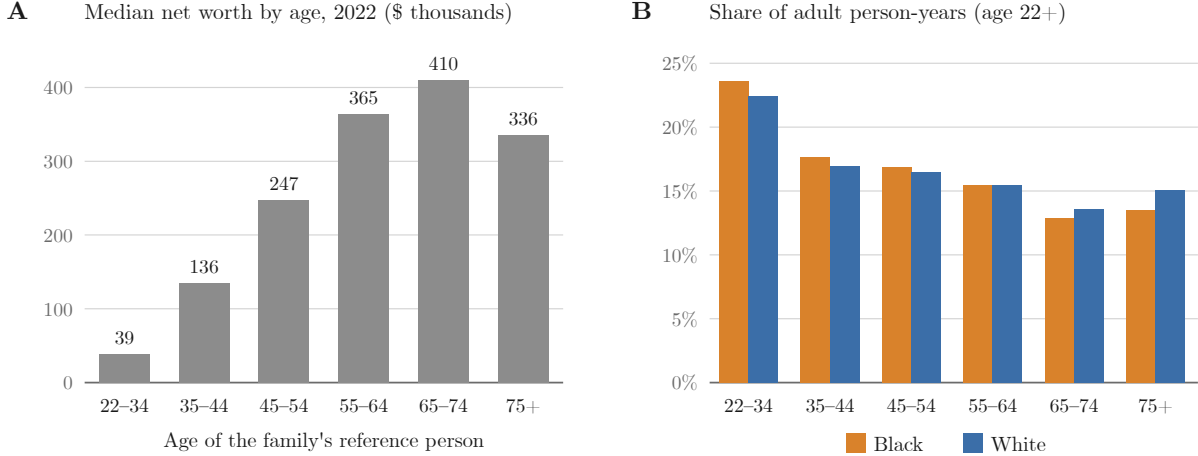


Figure 4. (A) Median family net worth by age of the reference person, 2022 Survey of Consumer Finances [5]. (B) Share of adult person-years (ages 22 and over) in each age group implied by the 2024 Black and White life tables. Weighting panel A by panel B (Equation 2) lowers the Black index by 2.5%: about 1.4% of the observed log gap.

Channel 2: the annuity structure of retirement income. Social Security retirement benefits are paid for as long as the beneficiary lives. For a person alive at 22, expected years of life at 67 and older are 12.8 in the Black population and 14.9 in the White population, 14% fewer; for men the figures are 10.6 and 13.3, 20% fewer. To translate years into money, consider two workers with identical earnings who pay payroll tax from 22 through 66 while alive and receive the same benefit from 67 while alive. The ratio of the expected present value of benefits to that of contributions is

$$\text{MW}_g = \frac{\sum_{x \geq 67} v^{x + \frac{1}{2} - 22} L_x^g}{\sum_{x=22}^{66} v^{x + \frac{1}{2} - 22} L_x^g}, \quad v = (1 + r)^{-1}, \quad (3)$$

and the Black-to-White ratio of MW isolates survival. At a 2% real discount rate, a Black worker’s expected retirement benefits per dollar of contributions are 11.7% lower than those of a White worker with the same earnings, and 17.2% lower for men (Table 2). The result barely moves with the discount rate.

Table 2. Retirement-only Social Security money’s worth (Equation 3) of a Black worker relative to a White worker with identical earnings and benefits. Values below 1 mean fewer expected benefit dollars per contribution dollar. Disability and survivor benefits, which this calculation omits, offset the gap for the group as a whole [23].

Real discount rate	All	Men	Women
0%	0.887 (−11.3%)	0.830 (−17.0%)	0.921 (−7.9%)
2%	0.883 (−11.7%)	0.828 (−17.2%)	0.916 (−8.4%)
3%	0.881 (−11.9%)	0.828 (−17.2%)	0.915 (−8.5%)

Retirement benefits are not the whole of Social Security. The program also pays disability and survivor benefits, and its benefit formula replaces a larger share of earnings for lower earners. Using a microsimulation that includes all three, the General Accounting Office (now the Government Accountability Office) found that, in the aggregate, Black and Hispanic Americans have higher disability rates and lower lifetime earnings and thus as a group tend to receive greater benefits relative to taxes than White Americans [23]. The retirement annuity penalizes shorter lives; the rest of the program, as designed, compensates on average. Private retirement income taken as an annuity carries no such offset, and the offset itself is a reminder that the same structures that pay by the year of life can be designed to protect those who have fewer of them.

Channel 3: the loss of a partner. Households pool earnings, and a death before retirement removes an earner. If two partners aged 30 face independent survival risks, the probability that at least one dies before 67 is $1 - S_m(30, 67) S_f(30, 67)$, where S denotes survival between the two ages in the sex-specific life tables. For Black couples that probability is 42.4%; for White couples, 30.7%. For couples aged 40, it is 39.3% and 28.4%. Each such death is a compound wealth shock: lost earnings, funeral and end-of-life costs, and, for a surviving parent of young children, years of single-income saving.

Channel 4: working lives. For a person alive at 22, expected years lived between 22 and 66 are 41.6 in the Black population and 42.8 in the White population, 2.9% fewer (4.0% for men). Holding annual earnings equal, expected lifetime labor income falls by the same proportion. This channel was enormous for cohorts born in 1900 [14]. Today it is modest, but it is concentrated in the deaths at 45–64 that Figure 3 highlights, when earnings and savings are near their peak.

Channels we do not quantify. Health shocks before death reduce employment and earnings [13]. Medical debt is more common among Black households: 28% reported it in the Census Bureau survey summarized by the Consumer Financial Protection Bureau, against 17% of White

households [24]. And early, repeated bereavement strains the same family networks that provide emergency help and transfers [17, 22].

Table 3. Channels from survival to wealth, holding earnings, saving, returns, and benefit rules equal. Computed from the 2024 life tables [8] and the 2022 age-wealth profile [5]; comparison rows from the Survey of Consumer Finances [5, 17].

Channel and measure	Black	White	Difference
<i>Age composition</i>			
Age-standardized wealth index, medians by age (\$ thousands)	229.3	235.3	-2.5% (1.4% of log gap)
<i>Retirement annuity</i>			
Years lived at 67+, per 22-year-old	12.8	14.9	-14%
Retirement benefits per contribution dollar, equal earnings, $r = 2\%$			-11.7% (men -17.2%)
<i>Partner loss</i>			
Couple aged 30: at least one partner dies before 67	42.4%	30.7%	+11.7 points
<i>Working life</i>			
Years lived at 22-66, per 22-year-old	41.6	42.8	-2.9%
<i>For comparison</i>			
Median family net worth, 2022 (\$ thousands)	44.9	285.0	-84%
Received an inheritance or gift, 2019	10.1%	29.9%	-19.8 points

Disability and survivor benefits and the progressive benefit formula offset the retirement-annuity row for the Black population as a group [23].

3.4 What “partly” means

Table 3 collects the estimates. They support three conclusions.

First, shorter lives do not explain the wealth gap away. The purely compositional effect is about 1.5% of the log gap. The gap is primarily a product of history and of continuing differences in income, inheritance, homeownership, and access to credit [7, 15, 16].

Second, the survival gap amplifies and transmits the wealth gap through channels that compound. A 12% shortfall in the value of a retirement annuity for the same earnings, a 42% rather than 31% chance that a couple loses a partner before 67, fewer working years, and more frequent health shocks and bereavements each reduce accumulation in the decades when wealth is built, and each reduces what is left to pass on. Because inheritances are already three times as common among White families [17], every channel that shrinks what Black families can transmit widens the next generation’s starting gap.

Third, the arrows run both ways. Lower wealth predicts earlier death [2, 4, 20], and earlier death predicts lower wealth. The two gaps share an upstream driver, chronic stress, which shortens lives through weathering [9, 19] and drains wealth through scarcity, debt, and stress spending (Section 5). That shared driver is where we believe a consumer product can help, modestly and measurably, without pretending to repair structural harms it did not cause.

4 Quality of life in the later years

Longevity counts years; people live in them. In 1980 Fries argued that if the onset of chronic illness could be postponed faster than death, illness would be compressed into a short period at the end of life [25]. Whether that happens for a given person depends heavily on resources.

Healthy years. In harmonized data from England and the United States, the socioeconomic disadvantage in disability-free life expectancy was largest for wealth: at age 50, people in the poorest group could expect seven to nine fewer years without disability than those in the richest [26]. Among Americans aged 54–64, those in the poorest wealth quintile had more than three times the ten-year risk of disability of those in the richest (48% versus 15%) [3]. Racial gaps extend to healthy years: in life-table models built from 1990 census data, Black Americans lived the fewest years of the major racial groups and spent a high proportion of them with a chronic health problem [27].

Money in later life. Under the Census Bureau’s official measure, 9.9% of Americans aged 65 and older were poor in 2024. Under the Supplemental Poverty Measure, which subtracts out-of-pocket medical spending and accounts for taxes and benefits, the rate was 15.0%, the highest of any age group, and medical expenses alone raised the older-adult rate by 3.7 percentage points [28]. Social Security lifted 20.1 million people aged 65 and older out of poverty [28], which is why the annuity channel in Section 3 matters so much.

Decisions in later life. Financial mistakes follow a U-shape over the life cycle; across ten kinds of credit decisions, they are least costly around age 53 and become more common with age thereafter [29]. Cognitive decline shows up in money before it shows up in medical records: Medicare beneficiaries living alone began to miss bill payments and experience other adverse financial events several years before a diagnosis of Alzheimer disease or a related dementia [30]. Changes in spending patterns are therefore an early signal that deserves careful, consent-based attention, not exploitation.

Connection. Across 148 studies, people with stronger social relationships had a 50% greater likelihood of survival over the follow-up periods studied, an effect comparable to quitting smoking [31]. Wealth buys more than care; it sustains participation in family and community life.

On this evidence, a good later life requires enough wealth to compress illness into the end of life rather than spread it across decades; protection from costly mistakes and exploitation as cognition changes; and the autonomy and connection that make long life worth having. All three are distributed unequally by wealth and therefore by race.

5 Stress spending: the everyday mechanism

Chronic stress shortens lives through the body. It drains wealth through behavior, and the clearest everyday example is spending that soothes a state rather than serves a goal. We use *stress spending* for purchases whose timing and content are better explained by the buyer’s momentary state (sadness, exhaustion, anxiety, depletion) than by their plans.

5.1 Emotion carries over into prices

Incidental emotions, unrelated to the purchase at hand, change what people will pay. In experiments with real goods and money, induced sadness raised the prices people chose to pay and lowered the prices at which they would sell, reversing the usual endowment effect [32]; sad participants who were also self-focused spent more on the same item [33]. Shopping can also repair mood. Making purchase decisions reduced residual sadness by restoring a sense of personal control [34], and unplanned treats bought to repair a bad mood were not, on average, followed by regret or guilt [35]. A product that treated every comfort purchase as pathology would therefore be wrong as well as unkind. The target is the pattern that hurts: repeated, escalating, regretted spending.

5.2 The body sets the stage

A single night of sleep deprivation shifted healthy volunteers from defending against losses toward seeking gains in risky choices, with corresponding changes in ventromedial prefrontal and anterior insula activity [36]. Heart rate variability (HRV) is linked to activity in brain regions that regulate emotion and threat and is widely used as a marker of stress and regulatory capacity [37]. Sleep debt, lower HRV, and higher resting heart rate, each measured against a person's own baseline, are therefore plausible if noisy indicators of the moments when self-regulation is hardest.

5.3 Scarcity narrows attention

Prompting people to think about a costly financial problem reduced cognitive performance among lower-income participants but not among higher-income ones, and the same sugarcane farmers performed worse before harvest, when poor, than after it [38]. Scarcity focuses attention on the present problem and leads people to over-borrow against the future [39]. Financial stress can impair the very capacities needed to escape it.

5.4 Mental health and money move together

In a survey of nearly 5,500 people in the United Kingdom with lived experience of mental health problems, 93% said they spent more than usual when unwell, 92% found financial decisions harder, and 59% had taken out a loan they otherwise would not have [40]. A meta-analysis found that people with unsecured debt had about three times the odds of a mental disorder (odds ratio 3.24) [41], and among 8,400 young American adults, high debt relative to assets was associated with higher perceived stress and depression, worse self-rated health, and higher diastolic blood pressure [42].

5.5 Products can make it worse

After states legalized online sports betting, betting spread quickly and savings fell as risky bets crowded out investment; among financially constrained households, credit card debt and overdrafts rose and available credit fell [43]. Always-on access to speculative or compulsive spending is not neutral for households under strain.

5.6 The loop, and where to break it

Together these findings describe a loop (Figure 1): adversity raises stress; stress, sleep loss, and low mood change what people buy; unplanned spending and debt raise financial strain; and financial strain is itself a chronic stressor that wears down the body. The loop can be interrupted at several points. Income support, debt relief, and health care act on its largest drivers. We work on a smaller point that existing institutions leave untouched: the moment just before the next purchase, when a little context, a little friction, or a commitment made in a calmer moment can change what happens next. Defaults [44], precommitment to future behavior [45], and self-chosen commitment devices [46] have changed financial behavior in other settings; we test whether the same tools, timed by context, can interrupt stress spending.

6 Other wealth gaps the same forces widen

The mechanisms in Sections 2–5 are not specific to race. Wherever savings must stretch over more years than they can cover, wherever stress is chronic, and wherever products profit from moments of weakness, wealth gaps open. This section describes eight such gaps; Table 4 summarizes the evidence and what Vueni does about each. Vueni does not target any group, and none of these characteristics is an input to any model. We name them so that our evaluation can measure whether the product narrows or widens each one (Section 9).

Women: more years, fewer dollars. Women live longer. In 2024, life expectancy at 65 was 20.8 years for women and 18.4 for men, and a woman alive at 22 can expect 16.7 years of life at 67 and older against 13.4 for a man, 25% more [8]. Those years must be funded from smaller balances. Among unmarried householders, women had less median wealth than men under 35, at 35–54, and at 65 and over; unmarried women under 35 held a median of \$8,040, 30.9% of their male counterparts’ wealth [47]. Older women are more often poor: in 2020–2022, 11.0% of women aged 65 and over were below the official poverty line, against 8.5% of men [48]. The partner channel in Section 3 adds to the burden. If both partners are 30 and their risks are independent, the 2024 life tables give the woman a 59% chance of outliving the man, so the longest stretch of later life is most often funded by a woman alone.

Hispanic Americans: long lives, thin buffers. Hispanic Americans live longer than non-Hispanic White Americans (81.8 years at birth against 78.9 in 2024) [8], a pattern described in 1986 as an epidemiologic paradox because it coexists with lower incomes [49]. Their wealth does not match their longevity. In 2022 the typical Hispanic family held \$61,600, about 22% of the typical White family’s \$285,000 [5]; 15.5% of Hispanic households had zero or negative wealth [47]; and among middle-aged families, 28% of Hispanic families held a retirement account, against 65% of White families [17]. A Hispanic 22-year-old can expect 17.5 years of life at 67 and older, 18% more than a White 22-year-old, to be financed with a fraction of the savings. Older Hispanic adults are poor at more than twice the rate of older White adults (17.4% against 7.7%) [48]. Here longevity is an advantage that the wealth gap turns into a risk: outliving one’s savings.

American Indian and Alaska Native people: the shortest lives. In 2024, American Indian and Alaska Native people had the lowest life expectancy of any racial or ethnic group in the life tables, 71.1 years, and only 65.4% of a birth cohort survives to 65 [8]. Older American

Indian and Alaska Native adults are poor at the same rate as older Hispanic adults, 17.4% [48]. Every survival channel in Section 3 applies with greater force. Yet the Census Bureau’s wealth report and the Survey of Consumer Finances both fold American Indian and Alaska Native households into a combined “other” category [5, 47], so the wealth gap is poorly measured. A gap that is not measured is hard to close; we flag it rather than estimate it.

Disability and mental health. In 2023, 25.3% of working-age people with disabilities lived in poverty, against 11.4% of those without [50]. Poor mental health and money problems feed each other: 93% of people with lived experience of mental health problems said they spent more than usual when unwell [40], and unsecured debt is associated with about three times the odds of a mental disorder [41]. For these members stress spending is most costly and least chosen. The Money and Mental Health Policy Institute has called for ways to help people avoid “financial self-harm” [40]; Calm Mode, guardrails, cooldowns, and accountability partners are our answer.

Gambling harm. Where sports betting has been legalized, household finances have measurably worsened. Average credit scores fell by about 0.8 points where betting became legal and by about 2.75 points where it moved online, alongside more bankruptcies, debt sent to collections, debt consolidation loans, and auto loan delinquencies [51]; among financially constrained households, savings fell and credit card debt and overdrafts rose [43]. Vueni’s gambling guardrail is enforced by the card network where merchants code as gambling and by detection where they do not (Section 8.7).

Penalty fees: the scarcity tax. Fees concentrate on households with the least slack. In data from large banks, the 9% of accounts with more than ten overdraft or nonsufficient-funds transactions a year paid 79% of all such fees [52]. Combined with scarcity’s toll on attention [38, 39], small, avoidable shortfalls become a steady drain on the households with the least wealth. Vueni’s forecast warns before a shortfall, and Calm Mode’s limits are sized so that essentials clear.

Values-based exclusion. Some households avoid interest-bearing products, or particular industries, for religious or ethical reasons. Religious reasons are among the barriers people report for not having an account, most often in the Middle East and North Africa and in South Asia, and Demirgüç-Kunt and Klapper estimated that products compatible with religious beliefs could raise account ownership there by up to 10 and 5 percentage points respectively [53]. When the only savings products conflict with a household’s values, saving happens in cash or not at all. Vueni’s Values mode offers interest-free savings, guardrails, and giving rules that the member chooses; it does not certify any product as meeting a religious standard.

Age. Families headed by someone under 35 held a median of \$39,000 in 2022 [5], and costly financial mistakes are more common among both younger and older adults than in middle age [29]. In later life, missed payments can precede a diagnosis of dementia by years [30]. Smart Nudges, Calm Mode’s suggestions, and consent-based accountability partners are designed to help at both ends of adult life, without diagnosing anyone.

Table 4. Wealth gaps that the mechanisms in Sections 2–5 widen, and what Vueni does about each. Vueni uses none of these characteristics as a model input; we name them so that we can measure whether the product narrows or widens each gap (Section 9).

Gap	Evidence	Mechanism	What Vueni does
Women	Women 65+ poor at 11.0% vs. 8.5% of men [48]; 16.7 vs. 13.4 expected years at 67+ per 22-year-old	More years to fund from smaller balances; most surviving partners are women	Forecast and Pots; Calm Mode; outcomes reported by gender
Hispanic Americans	Median wealth \$61,600, 22% of White [5]; 17.5 expected years at 67+	Longevity outruns savings	Forecast and Pots; interest-free option
American Indian and Alaska Native people	Life expectancy 71.1; older-adult poverty 17.4% [48]	Every survival channel in Section 3, at greater force	Same tools; we flag the measurement gap
Disability and mental health	Poverty 25.3% vs. 11.4% [50]; 93% spend more when unwell [40]	Stress spending and debt	Calm Mode, guardrails, cooldowns, accountability partner
Gambling harm	Credit scores fall most where betting is online [51]	Always-on speculative spending	Network blocks plus detection; seven-day cooldown
Penalty fees	9% of accounts pay 79% of overdraft fees [52]	The scarcity tax	Forecast warns before shortfalls; essentials clear
Values-based exclusion	Religious reasons cited as a barrier to accounts [53]	Saving outside the system	Values mode: interest-free savings, giving rules
Age	Under-35 median wealth \$39,000 [5]; mistakes rise in later life [29, 30]	Inexperience; cognitive change	Smart Nudges; consent-based partners

Across these gaps the pattern matches Section 3. Longer or shorter lives change how far wealth must stretch, chronic stress drains it, and products that profit from hard moments widen gaps fastest among those with the least room for error. That is the population Vueni is designed for, and the population on whom it must be evaluated.

7 Why we exist

The Understanding Company exists because the moment that matters most for financial health is invisible to the institutions that hold people’s money. A bank sees an amount, a merchant, and a time. It does not see that a purchase came at 11:48 p.m. after a night with two hours less sleep than usual, that it is the third order of the evening, or that the last order from this merchant went back. A health app sees the sleep and the heart rate but not the purchase. Each holds half of the story, and neither acts on it.

We believe financial health is a health behavior and should be designed like one. That means treating the moment before a purchase as a moment of care: understanding why someone is spending, not only what; offering friction the person chose in advance; and always protecting the essentials. It also means taking seriously the evidence in Sections 2–6: chronic stress and thin

buffers shorten lives, wealth and years compound together, and the burden of both falls hardest on households that have had the least room for error: disproportionately Black, Hispanic, and Native households, women who live longer on less, and people managing disability or mental illness.

Our product, Vueni, is a card and account built on seven commitments:

1. **Understanding, not judgment.** Every signal Vueni acts on is shown to the member in plain language (“Short sleep · 2h 12m below your usual”). An unexplained score reads as judgment; an explained one reads as understanding.
2. **Act before, not after.** Vueni’s interventions take effect ahead of the next purchase, while a choice can still be made, rather than arriving as a lecture after the money is gone.
3. **Essentials always clear.** Groceries, pharmacy, fuel, transit, utilities, insurance, and medical care are never flagged, and Calm Mode’s limit is sized so that they go through.
4. **The member is in charge.** Calm Mode is off, suggest, or auto, chosen by the member, and the default is suggest. A guardrail the member sets has a cooldown before it can be switched off: a commitment chosen in a calm moment for a hard one.
5. **Privacy by architecture.** Health data is reduced to three numbers on the phone, raw samples never leave it, and health data is never used for credit, underwriting, or advertising.
6. **Values-aware, not values-imposing.** Values mode lets members choose guardrails, interest-free savings, and a giving rule that fit their beliefs. Vueni does not certify any product as meeting a religious standard.
7. **Measure outcomes and publish them.** Section 9 sets out what we will measure and report, including results that do not flatter us.

We are not a bank: Vueni’s accounts, cards, and money movement are provided through Whop’s financial infrastructure and its partners. Nor do we claim that a card can close a racial wealth gap built over centuries. Our claim is narrower. A product that understands stress, buffers shocks, and helps people keep what they earn can move everyday quantities, such as unplanned debt, regretted purchases, and savings that survive a bad month, and those quantities, compounded across years, shape both ledgers.

8 The harness and the models

This section describes the Understanding engine as it exists in our codebase on October 1, 2026. The engine is pure, deterministic TypeScript: given the same member snapshot, it returns the same scores, matches, cycles, and interventions. It is covered by 45 unit tests, and every spending-related number in the app screens on our website (scores, cycles, forecasts, suggestions) is computed by the engine on a synthetic member rather than typed by hand. The iOS app that will supply health signals is not yet built, the engine has not been evaluated with members, and every weight below was set by hand. We report them so that they can be criticized.

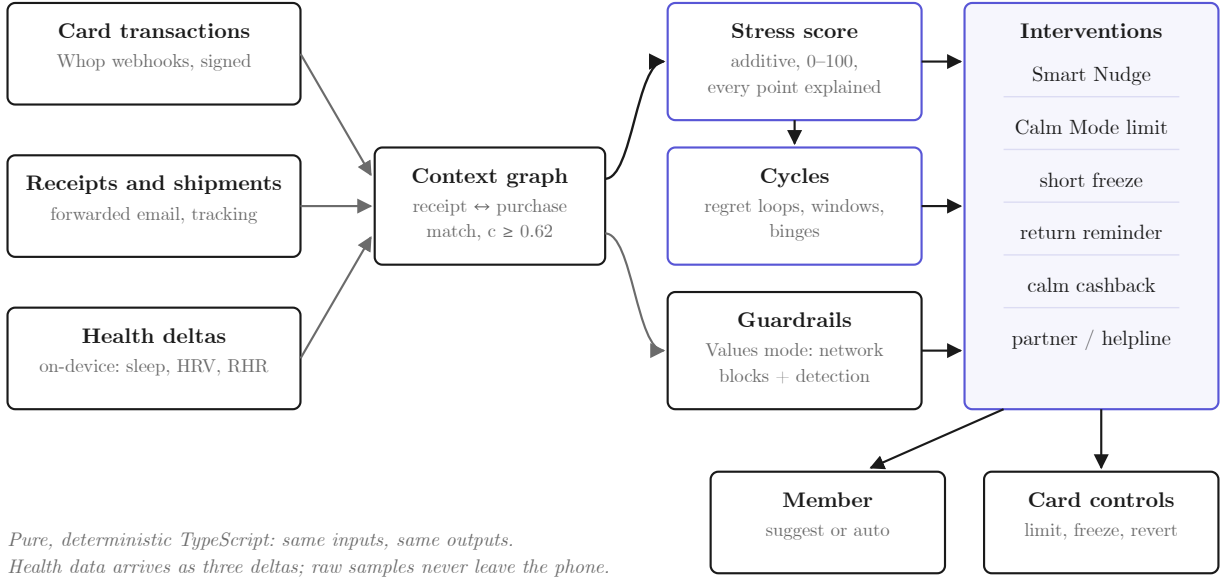


Figure 5. The Understanding engine. A card transaction anchors a context graph of receipts, shipments, and health deltas. Explainable scores and named cycles drive a ladder of interventions, which the member accepts (suggest mode) or is told about (auto mode). Values guardrails run alongside.

8.1 Constraints that shaped the design

Three facts about the platform shaped the engine. First, the card platform reports transactions after authorization and offers no real-time approve-or-decline hook, so the engine cannot stop a purchase in flight; it acts ahead of the next one by adjusting the card’s per-purchase limit, pausing the card briefly, or scheduling a reminder. Second, the card program declines some merchant categories at authorization by default, including the gambling codes; gambling-adjacent merchants that code themselves differently, such as sweepstakes casinos and prediction markets, can be detected only after the charge. Third, health data must stay on the phone. The iOS app will compute three deltas against the member’s own 14-day baseline (minutes of sleep below baseline, percent change in overnight HRV, and percent change in resting heart rate) and send only those; the server route accepts nothing else.

8.2 The context graph and receipt matching

A card transaction is the anchor; receipts, shipments, and health signals attach to it (Figure 5). Receipts arrive by email forwarding. A rule-based parser extracts the total, order number, items, return window, and tracking numbers; emails it cannot parse are reserved for a language-model extraction pass with the same output schema. A receipt is matched to the transaction it paid for by a weighted confidence

$$c = 0.50 s_{\text{amount}} + 0.35 s_{\text{merchant}} + 0.15 s_{\text{time}}, \quad (4)$$

where s_{amount} is 1 for an exact match to the cent, declines linearly to 0.4 at a 3% difference (absorbing tax, tips, and split shipments), and is 0 beyond; s_{merchant} is a bigram similarity after stripping payment-processor prefixes; and s_{time} declines linearly to 0 at three days. A match requires $c \geq 0.62$; otherwise the engine reports no match rather than guessing.

8.3 The stress score

For each purchase t , the version-0 stress score is additive:

$$S_t = \min \left(100, \sum_{k \in \mathcal{K}_t} p_k m_k \right), \quad m_k = \begin{cases} \beta(b_t) \sigma(a_t), & k \in \mathcal{C}, \\ 1, & \text{otherwise,} \end{cases} \quad (5)$$

where $\mathcal{K}_t$ is the set of factors present, p_k are the points in Table 5, and $\mathcal{C}$ is the set of contextual factors (time of day, sleep debt, HRV, and resting heart rate). The bucket weight β is 0 for essential merchant categories, 0.5 for uncategorized ones, and 1 for discretionary ones, and the size weight σ is 0.5 for purchases under \$15 and 1 otherwise. Context therefore never flags an essential and counts for less on a small coffee after a bad night. Health factors apply only when the latest signal was observed no more than 18 hours before the purchase. Scores of 35 and above are *elevated*; 60 and above, *high*. The model is deliberately simple: every point traces to a reason the member can see, so the explanation is the model.

Table 5. Factors and points in the version-0 stress score (Equation 5). Starred factors are contextual and are multiplied by the bucket weight β and size weight σ , so they never count on essential purchases. “Buying fast” applies only to discretionary purchases.

Factor	Condition	Points
Late night*	11 p.m. to 4 a.m., member’s local time	18
Late evening*	9 to 11 p.m.	8
Short sleep*	≥ 90 / ≥ 45 minutes below 14-day baseline	16 / 8
HRV down*	$\leq -15\%$ / $\leq -8\%$ against baseline	16 / 8
Resting heart rate up*	$\geq +8\%$ / $\geq +4\%$ against baseline	10 / 5
Buying fast	1 / 2 / ≥ 3 earlier discretionary purchases in 24 hours	4 / 10 / 14
Impulse category	department stores, apparel and shoes, electronics, digital goods, beauty, gifts, online catalogs	10
Comfort purchase	restaurants, bars, fast food and delivery, liquor, tobacco	6
Bigger than usual	$\geq 2.5 \times$ the member’s median purchase in the same bucket (5+ prior)	10
Returned here before	1 / ≥ 2 refunds at a similar merchant in 120 days	8 / 12

8.4 Cycles

Stress spending is rarely a single purchase. The engine names three recurring shapes back to the member. A *regret loop* is two or more stressed purchases (score of at least 35) refunded within 45 days. A *recurring window* is three or more stressed purchases on the same weekday and in the

same part of the day (mornings, afternoons, evenings, or nights, with purchases after midnight counted with the previous evening) across at least two weeks. A *binge* is three or more stressed purchases within six hours.

8.5 Interventions and Smart Nudges

Interventions follow a ladder that matches the strength of the response to the strength of the evidence (Table 6). When the most recent purchase, made within the past two hours, is high-stress, Calm Mode proposes, or in auto mode applies, a per-purchase limit until 8 a.m. local time; if the member has enabled it and the purchase is part of a binge, it proposes a three-hour pause instead. The limit is

$$L = \max \left(F, 5 \lceil 1.1 Q_{0.9}(E)/5 \rceil \right), \quad (6)$$

where $Q_{0.9}(E)$ is the 90th percentile of the member’s essential purchases and F is a floor of \$50, so that a large grocery run still clears. An elevated purchase triggers only a Smart Nudge, a short in-app or push message such as “Heavier day than usual. Want to sleep on the next one?” When a recurring window is known, Calm Mode is offered an hour before it opens. Stressed purchases with a stated return window generate a reminder three days before it closes. A week without a high-stress purchase earns a week of 1% cashback. Every limit and pause reverts automatically.

Table 6. The intervention ladder. In suggest mode (the default) the member accepts each limit or pause; in auto mode it applies and the member is told why. Every limit and pause reverts automatically.

Trigger	Response	Rationale
Elevated purchase (35–59) in the last two hours	Smart Nudge only	Light prompts preserve choice; suggestions and defaults shift behavior [44]
High-stress purchase (60+) in the last two hours	Per-purchase limit (Equation 6) until 8 a.m.; essentials clear	Sleep loss shifts risky choice toward seeking gains [36]
High-stress purchase within a binge, if enabled	Three-hour pause	Self-chosen commitment devices raise follow-through [46]
Known recurring window	Calm Mode offered an hour before it opens	Commit before the hard moment, as in Save More Tomorrow [45]
Stressed purchase with a return window	Reminder three days before the window closes	Regret that can still be undone; breaks buy-regret-return loops
Seven days without a high-stress purchase	1% cashback for seven days	Rewards calm rather than only restricting stress
Values guardrail match	Network decline, or pause, partner, and support	Self-exclusion benefits most participants [54]

8.6 Forecast

A cash-flow forecast identifies recurring flows (paychecks, rent, subscriptions) as three or more flows with the same counterparty at a weekly, biweekly, or monthly cadence whose amounts vary by less than 15%, and projects the balance for 30 days. Remaining spending is modeled as inde-

pendent daily draws from the last 60 days of history, so the 80% band widens with the square root of the horizon d :

$$\hat{B}_d = B_0 + d\hat{\mu} + R_d + X_d, \quad \hat{B}_d \pm 1.2816\hat{\sigma}\sqrt{d}, \quad (7)$$

where $\hat{\mu}$ and $\hat{\sigma}$ are the mean and standard deviation of daily discretionary spending, R_d is the sum of recurring flows due by day d , and X_d the sum of known one-off flows such as pending refunds.

8.7 Values guardrails

Members can turn on guardrails for gambling, alcohol, tobacco and vaping, adult content, and crypto and trading apps. Enforcement has two tiers, which the product never blurs: *network blocks*, where the card program declines a merchant category at authorization, and *detection*, where the engine recognizes a merchant after the charge and then pauses the card, notifies an accountability partner the member chose, or surfaces support resources such as a problem-gambling helpline. Switching a guardrail off takes effect only after a cooldown (seven days for gambling, two to three days for the others), so the guardrail is a commitment chosen in a calm moment rather than a setting undone in a hard one. Self-exclusion programs built on the same idea have been found to benefit most participants [54].

8.8 A worked example

Figures 6 and 7 show the engine’s output on the synthetic member behind our website: three weeks of card transactions, three receipts, and six health signals for “Alex,” whose Sunday nights are hard. Groceries, pharmacy, and fuel score 0 even after short nights. A \$6.50 coffee the morning after a poor night scores 25, below the elevated threshold, because context counts half on small tickets. The engine finds all three cycles: a regret loop (two stressed purchases totaling \$306, both returned within 45 days), a recurring window (Sunday nights: six stressed purchases across four weeks, \$566), and a binge (three purchases in six hours, \$244). At 11:48 p.m. on the fourth Sunday, a \$128 order from a merchant whose previous order Alex had sent back scores 83. The engine matches the order-confirmation email to the charge with confidence 1.0, proposes a \$125 per-purchase limit until 8 a.m. (110% of Alex’s 90th-percentile essential purchase, a \$112.45 grocery run, rounded up to \$5), and schedules a return reminder three days before the stated return window closes.

8.9 The engineering harness

The engine is a set of pure functions composed by a single entry point, `understand(member)`, which matches receipts, scores purchases, detects cycles, and plans interventions. Card events arrive by signed webhooks (verified under the Standard Webhooks scheme and deduplicated), receipts by an inbound-email route, and health deltas by an authenticated route that discards any field other than the three deltas. In auto mode, interventions execute through the card platform’s API; in suggest mode they are shown to the member first. A scheduled job reverts every temporary limit and pause. The 45 unit tests cover receipt parsing, matching, scoring, cycle detection, intervention planning, guardrails, giving calculations, and webhook verification.

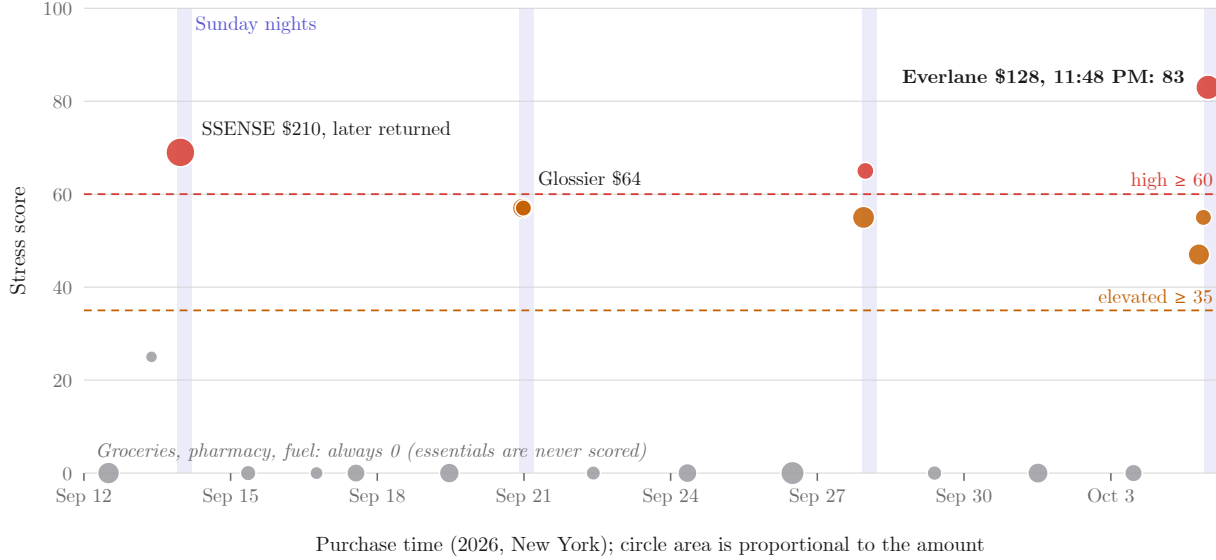


Figure 6. Three weeks of the synthetic member through the engine. Each circle is a purchase, colored by level (grey calm, orange elevated, red high). Shaded columns are Sunday nights, the recurring window the engine detects. Essentials stay at zero regardless of sleep or HRV.

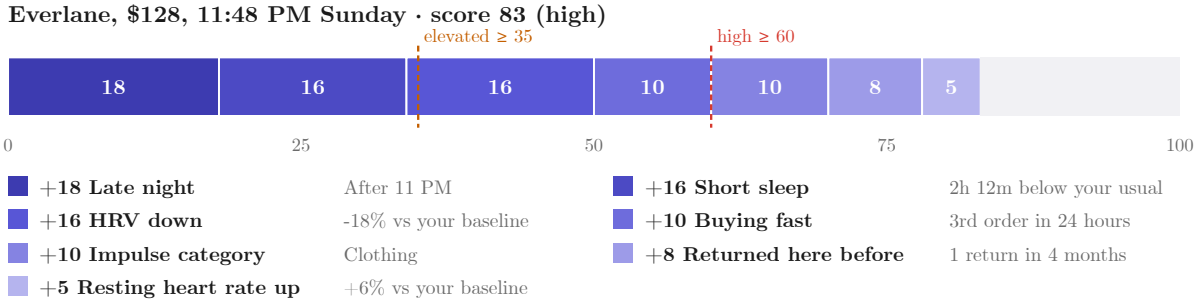


Figure 7. The explanation shown to the member for the 11:48 p.m. purchase. Each segment is one factor from Table 5; the sum is the score.

8.10 From hand-set weights to learned models

The version-0 weights are priors, chosen from the literature in Section 5 and from product judgment. Once members consent to outcome measurement, we plan to learn per-member weights. Our candidate is a generalized additive logistic model of the probability that a purchase is later regretted, with regret labeled by returns of the item, by the member’s own answers in the app, and by declined Calm Mode suggestions treated as disagreement. An additive model keeps the property we care about most: each prediction decomposes into per-factor contributions that can be shown to the member. Member-level random effects let the model learn that Sunday nights are hard for one person and Friday afternoons for another; monotonicity constraints keep explanations sensible (more sleep debt never lowers a score); and thresholds will be set to bound the rate of interventions on purchases members later endorse. Race, ethnicity, gender, disability, and

their proxies, such as names or neighborhoods, will not be features. Language models will be used where language is the task, such as extracting receipts and answering members’ questions, not to score people.

9 Evaluation and ethics

9.1 What we will measure

Before launch we will pre-register the design and outcomes in Table 7. Members who opt in to Calm Mode will be randomized, for a fixed period, between suggest mode and a holdout in which scores are computed but no interventions are shown, and analyzed by intention to treat. New intervention types will roll out in steps so that each can be evaluated against the others.

9.2 Fairness

Because the burden of stress spending is unequal, its benefits and harms might be too. We will report outcomes by income band and age band and, for members who choose to share them, by self-reported gender, race and ethnicity, and disability, the groups named in Section 6. These answers are collected only for auditing and stored apart from every decision system. We will check that interventions do not fire more often for some groups than others at equal underlying risk, and that the essentials floor protects lower-income members, whose essential purchases are smaller.

9.3 Privacy, autonomy, and paternalism

Health data is sensitive. As a health app that is not covered by HIPAA, Vueni is likely subject to the Federal Trade Commission’s Health Breach Notification Rule, and we treat health deltas as sensitive in storage, logs, and analytics. Members can turn Calm Mode off at any time; suggest mode is the default; every intervention explains itself and reverts automatically; and the only friction that persists is friction the member chose in advance. We will not sell data, use health data for credit or advertising, or optimize for engagement.

Table 7. Pre-registered outcomes for the randomized evaluation of Calm Mode (suggest mode against a scored-but-silent holdout).

Outcome	Measure	Role
Regretted spending	Dollar value of stressed purchases later returned or marked as regretted	Primary
Financial distress	Overdraft, declined-payment, and late-payment events	Primary
Savings	90-day change in savings balances	Primary
Use of the tool	Calm Mode acceptance and override rates; recurrence of named cycles	Secondary
Wellbeing	Self-reported financial stress on a validated scale; sleep and HRV trends for members who share them	Secondary
Harms	Declined essential purchases (target: zero), complaints, opt-outs, spending displaced to other cards	Harm
Equity	All of the above by income band and, if shared, self-reported race and ethnicity	Audit

9.4 What we will publish

We will publish the pre-registration; the outcome results, whether or not they favor the product; the distribution of interventions across groups; and every change to the model’s weights and thresholds.

10 Limitations

- Period life tables describe the mortality of one year, not the lived experience of a real cohort. The tables adjust for the misclassification of race and Hispanic origin on death certificates, which adds uncertainty [8].
- Our calculations hold earnings, saving, returns, and benefit rules equal across groups to isolate survival. The real differences in those quantities are far larger than the survival effects we report, and they interact with them.
- The composition calculation uses a single national age-wealth profile, measured by the age of each family’s reference person, and ignores differences in family structure and in the shape of the profile by race.
- The Social Security calculation covers retirement benefits only. The GAO analysis that includes disability and survivor benefits reaches the opposite aggregate conclusion [23], and both depend on the cohorts studied.
- The couple calculation assumes that partners’ survival is independent. In reality their risks are correlated, and bereavement itself raises mortality.
- Section 6 summarizes each gap from published sources; it does not decompose those gaps, the sources differ in years and measures, and several groups are small in national surveys.
- Much of the evidence in Sections 2, 4, 5, and 6 is observational. Wealth and health cause each other, and many studies cannot fully separate the two directions.
- The stress-spending evidence comes largely from laboratory studies and self-reports, and the mental-health survey is a self-selected U.K. sample [40]. Consumer measures of sleep and HRV are noisy; the engine’s health factors are proxies, not diagnoses.
- The Understanding engine has not been evaluated with members. Its weights are hand-set, the iOS app that will supply health signals is not built, and the worked example uses synthetic data.

11 Conclusion

Years and dollars are one ledger. Wealth buys time, time builds wealth, and chronic stress, distributed unequally by history and by race, draws down both accounts at once. The Black–White gap in survival is not the origin of the racial wealth gap, but it is one of the ways that gap persists: through retirement income that pays by the year, households that lose earners in their prime, and generations left with less to pass on and less time to pass it on. The Understanding Company exists to work on the part of this loop that lives in everyday money, the moment before a purchase made under strain. We have described what we built, how it works, and how we will know whether it helps. We invite scrutiny of all three.

Data and code availability

Life tables: National Center for Health Statistics, *United States Life Tables, 2024*, spreadsheet tables at ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/NVSR/75-05/. Wealth: Board of Governors of the Federal Reserve System, Survey of Consumer Finances. Every number in Sections 3, 6, and 8 that is not quoted from a source is computed by the replication files published with this paper at theunderstanding.company/research: `analysis.py` for the life-table accounting, with its public inputs, and the engine’s output for the worked example. The Understanding engine’s source code is proprietary.

Disclosures

This paper was written by The Understanding Company, which develops Vueni, the product described in Sections 7–9; readers should weigh our interpretation accordingly. Vueni has not launched, and no outcome data exist yet. Nothing here is financial, medical, or legal advice. The paper was prepared with the assistance of AI tools; all quantitative results were computed from public data with the scripts named above, and every citation was checked against its source.

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