

Research basis for the Personality.Coach enterprise economic case

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This document provides the peer-reviewed research basis for the economic claims presented on the personality.coach enterprise marketing page. The program offers nine personality-change tracks across the Big Five; economic value comes from several distinct mechanisms (reduced anxiety/burnout, increased work performance, improved team relationships, lower turnover). The evidence base spans personality-development research, organizational psychology, and health economics — not any single study. For each on-page claim, we cite primary sources, show the derivation chain from research finding to per-employee and per-cohort estimate, and flag claims that are well-supported, partially supported, or in need of revision. Intended for internal use and for diligence conversations with prospective enterprise customers.

1. Summary of claims and support

| Claim on enterprise page | Primary source / derivation | Status |
|--|---|---------------------------|
| ~1,500 PEACH participants | Stieger et al., 2021 (<i>PNAS</i>); n = 1,523 | Direct citation |
| Trait changes lasting at least one year | Roberts et al., 2017 meta-analysis — no decay at 1+ yr (d = 0.37); corroborated by Stieger et al., 2024 1-yr follow-up | Well-supported |
| \$1.39B excess cost per 1M people (top 25% Negative Emotion) | Cuijpers et al., 2010 — direct published figure (top-quartile excess cost per 1M inhabitants, 2007 USD) | Direct citation |
| \$100B productivity gains from 10% reduction | Chisholm et al., 2016 modeled <i>scaled-up treatment</i> ; we're extrapolating to a different intervention class | Conditional |
| 1.2B workdays recovered | WHO 2022 (citing Chisholm) × 10%; same conditional as above | Conditional |
| \$250–\$400 / affected employee / month savings | Modeled in § 3.1 from four mechanism estimates (Cuijpers 2010; Barrick & Mount 1991; Hill & Curran 2016; Wilmot & Ones 2022); range | Modeled projection |

| Claim on enterprise page | Primary source / derivation | Status |
|---|--|---------------------------|
| | reflects self-selection and trait-extremity | |
| \$185K–\$365K year-1 / 100-employee cohort (midpoint ~\$265K) | Per-track worked example in Appendix C (\$80K salary band; ~\$450K at higher bands). A projection — no interventional workforce-ROI study yet exists | Modeled projection |
| \$19,900 program cost per 100 employees | Internal pricing (\$199 × 100) | Direct |
| Payback ~4 months from contract signing | Appendix C.4 (12-week program + ~1 month savings accrual); downstream of the ~\$265K midpoint projection | Modeled projection |

2. Research base

2.1 Negative Emotion (Neuroticism) and economic burden

The economic burden of trait Negative Emotion (Neuroticism in the original literature) has been most directly quantified by Cuijpers et al. (2010), a population-based study (n = 5,504) of the Dutch general adult population that linked Neuroticism quartile to total annual per-person economic cost — including healthcare, out-of-pocket spending, and production losses.

Headline findings (USD, 2007 reference year):

- Top 5% of Neuroticism scorers: \$12,362 / person / year
- Top 10%: \$8,243 / person / year
- Top 25%: \$5,572 / person / year
- Excess costs per 1M population from the top 25%: \$1.393B

Critically, Cuijpers et al. found that excess costs from the top 25% of Neuroticism scorers were approximately 2.5× the excess costs of common mental disorders (\$1.393B vs. \$585M per 1M). This is because Neuroticism is continuously distributed, so the burden is borne by ~25% of all adults rather than the much smaller fraction with a diagnosed mental disorder.

Cuijpers et al. *do* break the per-person cost into components. For the top 25% of Neuroticism scorers, the \$5,572/year total (2007 USD) splits into roughly **\$302 direct medical (healthcare), \$203 out-of-pocket, and \$5,067 production losses** — about 91% of the burden is lost workplace productivity and only ~5% is direct healthcare spending. This matters for

framing: the cost of Negative Emotion is overwhelmingly a *productivity* cost — precisely the cost an employer carries.

For this reason the on-page stat now cites Cuijpers' own published figure directly — **\$1.393B in excess cost per 1M inhabitants from the top quartile** — rather than a U.S. extrapolation. For scale only: applied to the ~65M U.S. adults in the top quartile (~260M adults, 2026), the all-in cost is on the order of \$360B/year in 2007 dollars, but this carries two caveats — Cuijpers' sample is Dutch (a different healthcare cost baseline than the U.S.), and the figure is dominated by production losses, not healthcare. The earlier “\$120B U.S. healthcare costs” figure has been retired: it was not derivable as a healthcare-only subset, and the healthcare-only component is in fact small.

2.2 Workforce mental health and productivity loss

The Lancet Psychiatry economic analysis by Chisholm et al. (2016) — the primary research underpinning the WHO/World Bank “\$1 trillion” workforce mental health figure — estimated the global productivity cost of depression and anxiety at approximately **US\$1 trillion per year**, with **12 billion working days lost annually**. The same analysis estimated benefit-to-cost ratios of roughly **2.3–3.0:1 counting economic productivity alone**, rising to about **4:1** — the widely-cited WHO/World Bank headline — once the monetized value of health gains is included.

The WHO Mental Health at Work guidelines (2022, joint with the ILO) reaffirm these figures.

Important caveat on the \$100B / 1.2B figures used on the page: Chisholm et al. modeled the productivity gains from *scaled-up clinical treatment* (psychotherapy and pharmacotherapy) — not from personality-change programs. The math on the page (12B workdays × 10% = 1.2B; \$1T × 10% = \$100B) carries Chisholm's treatment-vs-no-treatment cost differential and applies it to a different class of intervention. Strictly, the right reading of these figures is conditional: *if a personality-change program were to produce a comparable reduction in workforce anxiety and depression burden, the recovered productivity would be on this order*. We do not yet have intervention data that establishes that conditional.

Within the U.S. specifically, major depression alone is estimated to cost the economy approximately \$210B a year (Greenberg et al., 2015; 2010 reference year) — a figure for major depressive disorder alone, not depression and anxiety combined. Gallup (2022) found that U.S. workers rating their mental health as fair or poor average 12 unplanned absence days per year vs. 2.5 days for other workers — implying approximately \$47.6B in U.S. annual productivity loss from absenteeism alone. Presenteeism costs are typically 5–10× absenteeism costs; in the U.S., mean presenteeism cost per affected worker is estimated at \$5,524/year (Evans-Lacko & Knapp, 2016).

2.3 PEACH lineage: efficacy and durability

The PEACH (*PErsonality coACH*) program lineage anchors our pedagogical and evidentiary base. Three key publications:

- **Stieger, Flückiger, Rügger, Kowatsch, Roberts & Allemand (2021, *PNAS*)**. Pre-registered randomized controlled trial, $n = 1,523$. 3-month smartphone-based intervention. Significant trait change in directions desired by participants, including reductions in Neuroticism.
- **Stieger, Flückiger & Allemand (2024, *Journal of Personality*)**. 1-year follow-up of the original cohort. Trait changes maintained for Openness, Extraversion, Agreeableness, Conscientiousness. Neuroticism reductions continued to deepen over the follow-up period. Effect sizes at 1-year follow-up: $d = 0.19$ to 0.35 across traits.
- **Olaru, Stieger, Rügger, Kowatsch, Flückiger, Roberts & Allemand (2024, *European Journal of Personality*)**. Measurement-invariance analysis distinguishing trait, facet, and nuance change — establishing that PEACH-induced change is observable not just at the broad trait level but at the more granular facet level.

Together this trio of publications establishes (a) that a digital coaching intervention can produce measurable Big Five trait change at the population level ($n \approx 1,500$), and (b) that those changes persist or deepen at 12 months post-intervention.

An important distinction we should not blur: the Personality.Coach program is built on the *same pedagogical lineage* as PEACH (the observation → train → reflect rhythm, the daily-prompt + weekly-theme + scenario architecture, the Big Five frame), but it is not the PEACH study product. Our curriculum, scenario library, cohort structure, and trait-track set differ. The durability and effect-size figures from Stieger et al. (2021, 2024) are properties of PEACH specifically, not inheritable evidence for our program. When we write “PEACH-lineage” we mean *built on the same evidence base and methodology, not independently validated at the same length*. Our own program will have its own outcome data once first cohorts complete; until then, PEACH-lineage citations support magnitude and feasibility for our specific product, while the broader intervention meta-analyses (§ 2.4) — notably Roberts et al.’s 207-study durability finding — carry the efficacy and durability evidence in their own right, independent of PEACH.

2.4 Meta-analytic evidence on personality intervention

Roberts, Luo, Briley, Chow, Su & Hill (2017, *Psychological Bulletin*). Meta-analysis pooling 207 intervention studies tracking Big Five trait change. Average effect size $d = 0.37$ over an average 24-week intervention; effects replicated across experimental and non-experimental designs and persisted in longitudinal follow-ups. **Crucially for durability, the authors broke results out by post-intervention follow-up window and found no fade — $d = 0.34$ immediately post-treatment, 0.48 at 0–6 months, 0.46 at 6–12 months, and 0.37 at one year or more — concluding that intervention can produce *lasting personality trait change*.** Emotional Stability (inverse of Neuroticism) was the primary trait showing intervention-driven change, followed by Extraversion.

Bleidorn, Schwaba, Zheng, Hopwood, Sosa, Roberts & Briley (2022, *Psychological Bulletin*). Meta-analysis of longitudinal personality data establishing that mean-level Big Five trait change is normative across the lifespan; intervention-driven change sits at the high end of naturalistic change rates.

2.5 Economic value beyond Negative Emotion — the other eight tracks

The Negative Emotion track is the most directly monetized in the literature, but the program offers eight other tracks, each with its own evidentiary base for organizational value. We summarize the three most consequential here.

2.5.1 Conscientiousness ↔ work performance

Barrick & Mount (1991, *Personnel Psychology*). The seminal meta-analysis on personality and job performance across five occupational groups (professionals, police, managers, sales, and skilled/ semi-skilled labor). Conscientiousness was the only Big Five trait that predicted job performance *consistently across every occupation and criterion* studied, with a corrected operational validity of $\rho = \mathbf{0.22}$ ($\rho = 0.23$ for both job proficiency and training proficiency). It outperformed the other four traits, whose mean validities were far lower — Extraversion 0.13, Emotional Stability 0.08, Agreeableness 0.07, Openness 0.04. The finding has been replicated dozens of times since; subsequent second-order meta-analysis (Wilmot & Ones, 2019, *PNAS*) confirms Conscientiousness as the most broadly relevant workplace trait.

Sizing the implication carefully. The right way to read $\rho = 0.22$ is as a standardized regression slope: a one-standard-deviation increase in Conscientiousness predicts roughly a **0.22-SD increase in job performance**. It is *not* a percentage lift in output — $\rho^2 \approx 5\%$ is the share of performance *variance* associated with the trait, a different quantity that must not be read as “5% more output.” To put the performance gain in dollars we use standard utility analysis, valuing one SD of job performance (SD_y) at a conservative ~40% of annual salary. Critically, the program does not move anyone a full standard deviation: intervention research puts realistic trait change at **~0.3–0.5 SD** (§ 2.4). So the realized gain is (trait-change SD) \times 0.22 \times SD_y . For an \$80K worker ($SD_y \approx$ \$32K) gaining 0.3–0.45 SD of Conscientiousness, that is roughly **\$2,100–\$3,200/year, or ~\$175–\$265/month** per participant.

2.5.2 Perfectionism (high-C \times high-N pattern) ↔ burnout

Hill & Curran (2016, *Personality and Social Psychology Review*). Meta-analysis of 43 studies ($N = 9,838$ across 663 effect sizes) on perfectionism and burnout. Perfectionistic *concerns* showed **medium-to-large positive relationships with overall burnout** and with each individual burnout symptom (exhaustion, cynicism, reduced efficacy). Perfectionistic *strivings* — healthier high standards without the self-evaluative component — were neutral or slightly protective.

Important nuance: “perfectionistic concerns” is closer to a hybrid of high Conscientiousness *and* high Negative Emotion than to high Conscientiousness alone. People high in Conscientiousness without elevated Negative Emotion typically present as perfectionistic *strivings*, which is not the burnout-driving pattern. Calling the “Lower Conscientiousness” track a perfectionism-mitigation intervention is therefore loose — it targets the C × N interaction, not C in isolation.

Practical implication: the program’s actual mitigation of perfectionism-driven burnout likely runs through *two* tracks operating in tandem (Lower Conscientiousness for over-striving employees who also score high on Negative Emotion, and Lower Negative Emotion as the primary route for the underlying anxiety). Crediting all of the perfectionism → burnout savings to the Lower Conscientiousness track alone is over-attribution; some of that mechanism overlaps with the Lower-NegEmo track’s savings.

2.5.3 Agreeableness, Extraversion ↔ relationships, team, turnover

Wilmot & Ones (2022, *Personality and Social Psychology Review*). Quantitative review of 142 meta-analyses on Agreeableness, covering N > 1.9 million participants across k > 3,900 studies. Eight broad themes characterize Agreeableness’s workplace function; three are directly enterprise-relevant:

- **Teamworking and social integration.** Higher Agreeableness predicts team cohesion, open communication, and reduced interpersonal friction.
- **Reduced turnover.** Social-integration scores are linked to lower turnover intent and reduced antisocial workplace behavior.
- **Lower antisocial behavior.** Including reduced workplace deviance, hostility, and grievance escalation.

Extraversion contributes complementarily: higher Extraversion predicts visibility, network size, and assignment to leader roles (Wilmot & Ones, 2019).

Notable caveat: a separate line of research documents *inverted-U* (“too much of a good thing”) relationships between these traits and several performance outcomes — contribution peaks in the mid-to-high range, then declines as scores get extreme (Le et al., 2011, *J. Applied Psychology*). Wilmot & Ones (2022) itself frames Agreeableness as largely linear, flagging a linear *downside* on individual career and earnings outcomes — either way, more is not uniformly better. This is why our program offers *both* directions (raise *and* lower) on these traits.

Critical methodological note — correlational, not interventional. Wilmot & Ones (2022) documents *associations* between trait levels and workplace outcomes in observational data. It does *not* establish that *intervening on* Agreeableness (or Extraversion) causally produces those outcomes. The research base for *changing* these traits and observing downstream organizational effects is much thinner than the base for *measuring* them. Our cohort projections assume that the

correlational evidence translates to interventional evidence; this is a plausible but not yet established assumption, and is one of the things first-cohort outcome data should test. We flag it explicitly because it is the largest interpretive leap in this document.

Turnover implication for the cohort math: U.S. average voluntary turnover costs are estimated at 50–200% of annual salary per departing employee (see Appendix B for SHRM / Gallup / Work Institute breakdowns). A 2-percentage-point reduction in turnover across a 100-employee cohort (e.g., 15% → 13%) represents 2 fewer departures × ~100% of salary = roughly 200% of annual salary saved — the specific dollar amount scales with the cohort’s salary band. This calculation inherits the correlational-vs-interventional caveat above.

3. Derivation of cohort-level estimates

3.1 Per-employee monthly savings

Per-employee economic value is not captured by any single published figure for a workforce-deployed personality program — no such study exists (see § 4.1). It can, however, be built up from four distinct value mechanisms across the nine tracks, each anchored to adjacent research. We stack defensible estimates per mechanism:

| Mechanism | Track(s) | Source | Defensible monthly value |
|---|---|---|---|
| Reduced anxiety / absenteeism / healthcare cost | Lower Negative Emotion | Cuijpers (2010); APA workforce data | ~\$100–\$450 / affected employee |
| Increased work performance | Raise Conscientiousness | Barrick & Mount (1991); Wilmot & Ones (2019) | ~\$175–\$265 / participant (0.3–0.45-SD gain × $\rho = .22 \times SD_y$; see § 2.5.1) |
| Reduced burnout (perfectionistic concerns) | Lower Conscientiousness <i>in combination with</i> Lower Negative Emotion | Hill & Curran (2016) | ~\$150–\$350 / affected employee (avoided turnover + recovered presenteeism; partial overlap with M1 — see § 2.5.2) |
| Improved relationships, lower turnover, less workplace conflict | Raise Agreeableness; raise / lower Extraversion contextually | Wilmot & Ones (2022) (<i>correlational; not interventional</i>) | ~\$80–\$200 / employee (cohort-amortized, illustrative turnover math) |

These mechanisms do not all apply to every employee — each employee picks one track and is affected primarily by the savings mechanism tied to that track. The cohort-level expected savings is therefore a weighted average across track mix and completion rate, not a sum across all mechanisms applied to every employee.

Where the \$250–\$400/affected-employee/month figure on the page comes from.

Averaging the mid-points of the four mechanism ranges above gives ~\$210/affected/month. Two factors push the realistic figure above that simple mid-of-mid. First, *self-selection*: participants choose their own track, so the people on (say) the Emotional Stability track are those for whom it is a live problem — the “affected” group, not the cohort average — and motivated, volitional changers show larger effects (PEACH desired-direction $d \approx 0.5$ vs the 0.37 all-comers average). Second, *trait-extremity*: those pickers skew toward the high end of the distribution, where Cuijpers’ cost curve is convex (top-decile scorers carry ~\$8,243/yr vs \$5,572 for the top quartile). Netting these against the de-duplication in Appendix A, the defensible band is **~\$250 (conservative) to ~\$400 (favorable) per affected employee per month** — which is why the page shows a range, not a single point.

3.2 100-employee cohort projection

The full per-track worked example is in **Appendix C**. For a 100-employee mid-market cohort (70% completion, \$80K average salary), the bottom-up sum across the four mechanisms lands in a **\$185K–\$365K year-1 range, midpoint ~\$265K** — the spread driven by effect-size assumptions and by replacement cost (100% vs 150% of salary). Higher-salary cohorts (\$100–120K, common in tech) push the upper end toward ~\$450K. Against the one-time program cost of \$19,900 (100 seats × \$199 early-bird), the midpoint is a first-year ROI of roughly **13×** (range ~9–18×), with payback ~4 months from contract signing.

Two honest caveats on this projection. First, it is a projection, not a measured outcome — no interventional study yet quantifies workforce ROI for a personality-change program (§ 4.1). Second, the largest single dollar driver in Appendix C is turnover avoidance (mechanisms M3 and M4, ~\$120K of the ~\$265K midpoint — roughly 45%), and that turnover math rests on correlational rather than interventional evidence and on a modeled avoided-departure count (see C.3). A cohort whose savings lean more on the better-evidenced Negative Emotion track would show a lower total on firmer ground.

3.3 Benchmarking against published ROI evidence

Published return-on-investment figures for workplace mental-health programs cluster around **3:1 to 5:1**. The WHO / Lancet Psychiatry analysis (Chisholm et al., 2016) found ~2.3–3.0:1 counting economic productivity alone, rising to ~4:1 once the value of health gains is included. Deloitte’s reviews found returns of ~£5.10 per £1 for proactive (early-stage) interventions and ~£3.40 for reactive ones (2022 edition), and an average of £4.70 per £1 (2024 refresh).

The ~13× first-year ratio projected above (range ~9–18×) sits above that band. The difference is *cost structure, not effect size*: the Deloitte and WHO benchmarks describe programs with recurring per-employee cost (EAPs, ongoing therapy access), whereas this program is a one-time \$199/seat license. The dollar *savings* we project per employee are in line with — not above — that literature; the ratio is high only because the denominator is small. We therefore recommend the enterprise page lead with the dollar savings and the payback period, and treat the ROI multiple as a secondary figure, so it is not misread as an outlier effect-size claim.

4. Limitations and what we cannot yet claim

4.1 Limitations of the research base

- PEACH trials enrolled *self-motivated* participants (volitional personality change). Effects in less-motivated workplace populations may be smaller.
- Effect sizes ($d = 0.19$ to 0.37) are statistically robust but represent modest mean-level change. Individual response varies.
- No published research yet quantifies organizational-level ROI from a *workforce-deployed* personality change program. All cohort projections are extrapolations from individual-level studies.
- Cuijpers et al. (2010) figures are from a Dutch sample in a 2007 reference year. U.S. extrapolations are reasonable in magnitude but not identical in composition or healthcare-system structure.

4.2 What we will know once we have cohort data

After the first enterprise cohort completes, this document should be revised to replace extrapolated per-employee figures with actual:

- Completion rate
- Mean facet movement, especially on Negative Emotion / Emotional Stability
- Self-reported life-satisfaction and presenteeism outcomes
- (Optional, with employer consent) employer-reported productivity / absenteeism deltas

Appendix A: Cost-category ownership and de-duplication

The four economic mechanisms in § 3.1 do not all map to disjoint cost categories. Naively summing them would over-count. This appendix shows which mechanism “owns” each cost category and where the overlaps sit.

| Cost category | M1: Lower NegEmo | M2: Raise Consc. | M3: Lower Consc. (perfect.) | M4: Raise Agr. / Extr. | De-dup rule |
|---|--|---------------------|--|--|--|
| Healthcare cost (mental-health claims, EAP) | Primary | — | — | — | M1 only |
| Absenteeism (mental-health days, sick days) | Primary | — | Secondary | — | Attribute to M1 if employee picked NegEmo track; M3 otherwise |
| Presenteeism (working but reduced output) | Primary (anxiety- driven) | — | Primary (perfectionism- driven) | — | Split by track choice; do not sum within an employee |
| Voluntary turnover (separation + replacement) | — | — | Primary (burnout exits) | Primary (fit / relationship exits) | Split by departure cause; do not sum within an employee |
| Productivity ceiling (max output capacity) | — | Primary | — | — | M2 only |
| Team / relational drag (conflict, low cohesion) | — | — | — | Primary | M4 only |

In practice, since each employee picks one track, the cohort-level total rolls up cleanly: assign each completing employee to the cost categories unlocked by their track, and sum across employees. The double-count risk appears only if someone tries to compute “total savings per employee” by summing across all four mechanisms; that approach is incorrect and is avoided in Appendix C.

Quantifying the overlap. The two categories with real cross-mechanism overlap are:

- **Presenteeism between M1 (anxiety-driven) and M3 (perfectionism-driven).** Perfectionistic concerns are tightly correlated with high Negative Emotion (see § 2.5.2). An employee who picks Lower-NegEmo and an employee who picks Lower-C-for-perfectionism are typically *different* people (only the rarer high-C/high-N combination would qualify for both), so overlap at the cohort level is modest. We estimate ~5–10% of cohort-summed

presenteeism savings is over-counted by attributing M3 savings entirely to the Lower-C track when some of that mechanism overlaps with what Lower-NegEmo would have captured.

- **Voluntary turnover between M3 (perfectionism exits) and M4 (relationship-driven exits).** A departure caused by burnout and one caused by relationship friction are usually distinguishable, but in a real cohort we don't observe causes cleanly. Estimated overlap: ~5–10% of turnover savings risk being attributed to both mechanisms.

Combined overlap effect on the cohort-summed total: roughly **10–15% de-duplication adjustment** applied to the gross sum across mechanisms. Appendix C applies this explicitly.

Appendix B: Turnover replacement costs — better-grounded figures

Section 2.5.3 used an illustrative \$50K replacement cost. Here we replace it with role-graded figures from the canonical sources.

| Role level | SHRM range (% of annual salary) | Gallup range | Typical example |
|-----------------------|---------------------------------|--------------|---|
| Entry / frontline | 30 – 50% | ~40% | Customer support, retail floor, junior IC |
| Mid / skilled IC | 125 – 150% | ~80% | Engineers, analysts, knowledge workers |
| Specialized / manager | 150 – 200%+ | ~200% | Senior IC, first-line managers |
| Executive / leader | 200 – 400% | 200%+ | C-suite, VPs, principal-level specialists |

Direct cost components per departure (Work Institute, 2023):

- **Recruiter fees:** 15–25% of annual salary if external. For a \$70K role: \$10,500–\$17,500.
- **Baseline onboarding:** \$1,830–\$4,100 per employee, before role-specific training.
- **Ramp time:** new hires take 6–12 months to reach full productivity. Output during that period is typically 25–50% below baseline.
- The Work Institute estimates ~11% of salary in direct costs, ~22% in indirect/hidden costs — so the “sticker” replacement cost is meaningfully lower than the all-in cost.

For the cohort math in the rest of the document we'll use a default of **100% of annual salary** as the all-in replacement cost for mid-skilled employees — the lower end of SHRM's mid-level range and the most defensible single figure for a generic mid-market workforce.

Appendix C: Worked example — 100-employee mid-market company

A concrete walkthrough for a hypothetical 100-employee mid-market technology or professional-services company, with explicit assumptions throughout.

C.1 Assumptions

- Cohort size: 100 employees
- Average annual salary: \$80,000 (mid-skilled IC mix)
- Baseline voluntary turnover: 18% / year (typical for U.S. tech sector)
- Baseline mental-health-affected (fair/poor self-rated): 19% of workers (Gallup, 2022)
- Completion rate: 70% (~70 of 100 employees complete the program)
- Replacement cost per departure: 100% of salary = \$80,000 in the conservative case, up to 150% = \$120,000 in the favorable case (Appendix B: SHRM mid-skilled range is 125–150%)

C.2 Track-mix assumption

Important: this track-mix split is a fabricated illustration. We have zero empirical data on how employees actually self-select across the nine tracks — the numbers below are a guess at a plausible distribution for a mid-market workforce, used only to make the cohort arithmetic concrete. The split will change once we have first-cohort intake data and may shift significantly by industry, salary band, and rollout communications.

| Track | % of cohort | Headcount (of 100) | Completing (70%) |
|---|-------------|--------------------|------------------|
| Lower Negative Emotion | 35% | 35 | 25 |
| Raise Conscientiousness | 25% | 25 | 17 |
| Lower Conscientiousness (perfectionism) | 15% | 15 | 10 |
| Raise Agreeableness | 15% | 15 | 10 |
| Other tracks (E, A-lower, O, etc.) | 10% | 10 | 8 |

C.3 Per-track ROI calculation

Each track's contribution is shown as a **conservative / midpoint / favorable** figure, using the mechanism values from § 3.1. The ends differ mainly in the assumed trait-change effect size (~0.3 SD vs ~0.5 SD — the latter reflecting motivated, self-selecting participants, § 2.4), the replacement

cost (100% vs 150% of salary), and the modeled avoided-departure counts. The midpoint is the central estimate.

M1 – Lower Negative Emotion (25 completers)

- Per-participant annual saving: \$3,200–\$4,200/yr — a fraction of Cuijpers’ productivity excess (\$5,067/yr for the top quartile, higher for the top decile that self-selecting pickers skew toward), recovered by a motivated ~0.3–0.5-SD emotional-stability gain (healthcare + presenteeism + absenteeism). Self-selection means pickers are essentially the affected group.
- Cohort contribution (25 completers): **\$80K / \$90K / \$105K** (conservative / midpoint / favorable)

M2 – Raise Conscientiousness (17 completers)

- Per-participant value via utility analysis (§ 2.5.1): (trait-change SD) × $\rho = .22 \times SD_y$, with $SD_y \approx 40\%$ of \$80K = \$32K. A 0.3–0.45-SD Conscientiousness gain → \$2,100–\$3,200/yr.
- Cohort contribution (17 completers): **\$36K / \$45K / \$54K** (conservative / midpoint / favorable)

M3 – Lower Conscientiousness with high-N pattern (10 completers)

- Reduced burnout-driven turnover and recovered presenteeism. Hill & Curran (2016) shows medium-to-large burnout effects for perfectionistic concerns; burnout is a leading voluntary-turnover driver. Modeled avoided departures in this subgroup: **0.6–1.1 over 12 months** (vs ~1.8 expected at 18% baseline — a 33–61% local reduction; flagged as the most aggressive single assumption in this model).
- Replacement cost saved: 0.6–1.1 departures × \$80K–\$120K (gross; the M1/M3 presenteeism overlap is removed in the C.4 de-duplication line, not here).
- Cohort contribution (gross): **\$48K / \$85K / \$132K** (conservative / midpoint / favorable)

M4 – Raise Agreeableness (10 completers)

- Reduced relationship-driven turnover and team-conflict drag. Inheriting the correlational-vs-interventional caveat from § 2.5.3, we apply a confidence factor of 0.7–0.85 to the illustrative turnover math. Modeled avoided departures: **0.5–1.0**.
- 0.5–1.0 departures × \$80K–\$120K × 0.7–0.85 confidence.
- Cohort contribution: **\$30K / \$64K / \$102K** (conservative / midpoint / favorable)

Other tracks (8 completers)

- Mixed ROI — leadership pipeline (Extraversion), focus depth (Extraversion-lower), creative range (Openness). \$2,000–\$3,000/participant/year.

- Cohort contribution (8 completers): **\$16K / \$20K / \$24K** (conservative / midpoint / favorable)

C.4 Cohort totals

| Line item | Conservative | Midpoint | Favorable |
|--|--|----------------|----------------|
| M1 Lower NegEmo | \$80K | \$90K | \$105K |
| M2 Raise Conscientiousness | \$36K | \$45K | \$54K |
| M3 Lower Conscientiousness (burnout) | \$48K | \$85K | \$132K |
| M4 Raise Agreeableness | \$30K | \$64K | \$102K |
| Other tracks | \$16K | \$20K | \$24K |
| Gross sum across mechanisms | \$210K | \$304K | \$417K |
| De-duplication (Appendix A, ~12%) | -\$25K | -\$38K | -\$52K |
| Net cohort savings (year 1) | ~\$185K | ~\$265K | ~\$365K |
| Per-completing-employee / month (70) | ~\$220 | ~\$315 | ~\$435 |
| Per-seat / month (100 seats) | ~\$154 | ~\$221 | ~\$304 |
| One-time program cost (100 × \$199) | \$19,900 | | |
| First-year ROI (net ÷ \$19,900) | ~9× | ~13× | ~18× |
| Payback from contract signing | ~4 months (midpoint; 12-wk program + ~1 mo accrual) | | |

3-year cumulative. Year-1 savings do not all recur. The performance and well-being mechanisms (M1, M2, Other, and the presenteeism part of M3) recur in years 2–3 and are durable — Roberts et al. (2017) found intervention-driven trait change undiminished a year or more out (§ 2.4) — so we decay them only ~12%/year. The turnover-avoidance portion (M4 and the turnover part of M3) is largely a *one-time* Year-1 event: a retained employee faces a fresh turnover hazard the following year, so we do not carry it forward. On that split, the midpoint runs \$265K (Y1) + ~\$153K (Y2) + ~\$135K (Y3) = **~\$550K over three years**, with a conservative-to-favorable range of roughly **\$400K–\$750K**.

C.5 Sensitivity

The cohort total is most sensitive to four inputs:

- **Track mix.** A heavier skew toward perfectionism-burnout (M3) or relationship-driven turnover (M4) raises savings because turnover avoidance is the largest single dollar driver. A cohort skewed toward Openness or Extraversion shifts produces lower direct dollar ROI (real but harder to monetize cleanly).
- **Average salary.** Turnover-driven savings scale linearly with salary. At \$120K average salary the cohort total rises by ~50% on the turnover line items.
- **Baseline turnover rate.** A workforce starting at 25%+ turnover has more upside than one at 10%.
- **Completion rate.** 70% is a target. At 50% completion the savings drops proportionally; at 80%+ it rises.

The conservative and favorable columns in C.4 sweep the effect-size, replacement-cost, and avoided-departure assumptions, giving a **\$185K–\$365K** Year-1 range at an \$80K salary band (midpoint ~\$265K). Salary is a further multiplier — the performance and turnover lines both scale with it — so a **\$100–120K cohort** (typical of the tech and professional-services buyers this program targets) lifts the favorable case to roughly **~\$450K year-1, ~\$900K over three years, and ~22× first-year ROI**. These higher-salary favorable figures are the ones the enterprise marketing page leads with: they stack optimistic-but-defensible assumptions (motivated ~0.5-SD effects, 150% replacement cost, the higher salary band), each spelled out above. If those do not all hold, the conservative column (**~\$185K, ~9×**) is the floor.

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