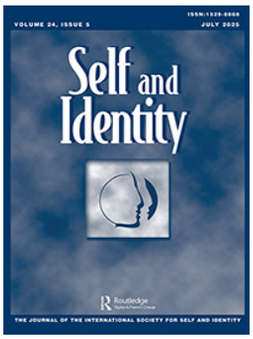

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Difficulty-as-improvement in daily life: believing that difficulties are character-building supports well-being, effortful engagement, and experiencing successes

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ABSTRACT

People vary in how much they endorse "difficulty-as-improvement," believing that suffering unbidden life difficulties can sanctify, strengthen, build character, or elevate their spirit. Across four two-week diary studies ($N = 382$), endorsing "difficulty-as-as-improvement" is associated with positive self-beliefs and carries over to preferences for more effortful means of attaining possible self-goals. On average, people reported experiencing difficulty on 88.16% of the days they filled in a diary. Within-person daily variability in difficulty-as-improvement scores was associated with daily action, outcomes, and self-judgments, controlling for the positivity-negativity of daily events in multilevel analyses. Endorsing difficulty-as-improvement supports meaning (difficulties happen for a reason) and worth (you are good enough); lagged analyses suggest small-sized effects of yesterday's difficulty-as-improvement on today's self-esteem and sense of life as meaningful.

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Believing difficulties can build character supports daily well-being

What does it mean about you that your life feels hard to think about as it is strewn with unbidden setbacks and obstacles? One religion-based perspective is that it implies that suffering is your fate, something deserved, a manifestation of your moral or spiritual defilement (see Rai & Fiske, 2011). According to identity-based motivation theory, a situated social cognition theory of self-regulation, motivation, and goal pursuit, it can also mean something else because a more positive alternative, rooted in spiritual and religious teachings, exists – that enduring hardships can purify the soul, make one more empathic to others, and bring one closer to God (Oyserman, 2024). Thus, rather than only believing that having unbidden setbacks is a negative manifestation of what is wrong with them, people may also see them as a potentially positive signal that enduring unbidden setbacks will make them purer and stronger (Kiper et al., 2022; Oyserman, 2024; Yan et al., 2024). The implication is that when their unbidden life obstacles and considering them feels hard to think

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about, people holding this difficulty-as-improvement belief will infer that it is not the obstacle but the enduring that matters (Yan et al., 2024). Identity-based motivation theory predicts that people's self-beliefs, the inferences they draw about themselves when it feels hard to think about their lives, tasks, and goals, and what they do, are recursively related and dynamically constructed in context (Oyserman, 2007, 2015). Though central to identity-based motivation theory, as we summarize below, studies have not yet been designed to test for dynamic construction in the form of meaningful within-person variability. We address this gap by testing five hypotheses derived from identity-based motivation theory across four 14-day diary studies. We outline identity-based motivation theory and relevant evidence before detailing our predictions, methods, and results.

Identity-based motivation theory

Identity-based motivation is a social psychological theory of motivation, goal pursuit, and self-regulation (Oyserman, 2007, 2009, 2024). Identity-based motivation theory predicts a recursive relationship between self-beliefs (e.g., how certain people feel about an aspect of their identity) and what they do and infer when engaging or thinking about their life, tasks, and goals is difficult (Oyserman, 2007, 2024; Oyserman & Yan, 2019). It predicts that people prefer to act and make sense of their metacognitive experiences in ways that fit their identities, but which aspects of identity come to mind and what they imply for metacognitive inference and action are dynamically constructed, given features of the situation. Hence, each of the three components of identity-based motivation should be: (1) measurable, (2) vary between and within persons depending on context, and (3) be related, though not redundant.

Inferences from metacognitive experiences of difficulty

Consider the recursive path from identity to inferences from difficulty and the path from inferences about difficulty to identity. According to identity-based motivation theory, people feel more certain of attaining their self-relevant goals, perform better at potentially self-relevant tasks, and find engaging with these tasks a "me" thing to do – when applying a difficulty-as-importance lens (in everyday discourse, "no pain, no gain" Oyserman, 2007, 2024). They feel less certain that an on-the-mind identity is truly self-defining and so find engaging with tasks related to that identity a waste of their time and unlikely to yield self-benefits when applying a difficulty-as-impossibility lens, unless an easy means to goal attainment exists (in everyday discourse, "cut your losses" Fisher & Oyserman, 2017; Kiper et al., 2024). When applying a difficulty-as-improvement lens, given that they see suffering as not random but part of a higher being's plan for them, they focus on their virtuous character traits, experience optimism for the future, and find more meaning in life (Yan et al., 2024). Empirically, having this difficulty-as-improvement lens carries over to seeing suffering as the "high road" and a preference for effortful means to attain self-relevant goals (Kiper et al., 2024). In this way, people's metacognitive experience of difficulty can be a green light of importance signaling you to get going, a detour sign of impossibility signaling you

to shift to something else, or angel wings pointing you to the effortful route (Oyserman, 2024).

Convergent and discriminant validity

Each of these three inferences from the metacognitive experience of difficulty has been operationalized as a scale (difficulty-as-importance, difficulty-as-impossibility, difficulty-as-improvement; Elmore et al., 2016; Fisher & Oyserman, 2017; Yan et al., 2024). The difficulty-as-importance, difficulty-as-impossibility, and difficulty-as-improvement scales have been validated as distinct from one another and related motivational constructs (Fisher & Oyserman, 2017; Haque & Oyserman, 2024, 2025; Kiper et al., 2024; Yan et al., 2024). Specifically, each has been compared with self-efficacy, optimism, locus of control, promotion and prevention, growth mind-set, grit, and positive and negative affect.

From a measurement lens, as detailed by Yan et al., 2024 in 10 studies using adult respondents in eight countries (Australia, Canada, China, India, Iran, New Zealand, Turkey, the United States, $N = 3532$), trait difficulty-as-importance, difficulty-as-impossibility, and difficulty-as-improvement can be measured reliably, and each shows measurement invariance. These authors report support for configural (construct structure), metric (item factor loadings), and scalar (item intercepts) measurement invariance for difficulty-as-improvement and support for configural and metric invariance for difficulty-as-importance and difficulty-as-impossibility. That is, items load onto the expected single factor and can be assumed to load the same way across samples from countries that vary in traditionality and Westernization.

Regarding discriminant validity, trait difficulty-as-importance, trait difficulty-as-impossibility, and trait difficulty-as-improvement scores are distinct when simultaneously assessed. Using Kline's (2011) rule-of-thumb for discriminant validity ($rs < 0.85$), trait difficulty-as-improvement scores are distinct from trait difficulty-as-impossibility and trait difficulty-as-importance scores. The association between difficulty-as-impossibility and difficulty-as-improvement has a 95% confidence interval ranging from $r = -.04$ to $-.39$ (Yan et al., 2024, p. 10 studies) and $r = -.04$ to $-.26$ (Kiper et al., 2024, three studies). The association between difficulty-as-importance and difficulty-as-improvement has a 95% confidence interval ranging from $r = 0.23$ to 0.68 (Yan et al., 2024, p. 10 studies) and $r = 0.62$ to 0.74 (Kiper et al., 2024, three studies). Moreover, controlling for trait difficulty-as-importance and trait difficulty-as-impossibility, trait difficulty-as-improvement is associated with seeing silver linings for oneself and one's community during the height of the COVID-19 pandemic (Kiper et al., 2022).[1]

Regarding difficulty-as-improvement, Yan and colleagues (2024) document small-to-moderate-sized positive correlations between difficulty-as-improvement and religiosity, conservatism, belief in fate, and belief in karma across 10 studies and eight countries. Haque and Oyserman (2024, 2025) document a small-sized positive association with Protestant Work Ethic and work values in U.S. samples. Another way to document discriminant validity is to examine its incremental effects, controlling for difficulty-as-importance and difficulty-as-impossibility scores. Doing so reveals that the more people endorse difficulty-as-improvement, the more they see themselves as virtuous, optimistic, and conscientious people leading meaningful lives (small-to-moderate-sized effect, 10

studies, across eight countries, Yan et al., 2024). As a follow-up, Yan and colleagues (2024) also added a measure of growth mindset to the model, finding that results are robust to adding this control.

They did so because the terms growth and improve might seem similar at a surface level. As they note, a closer consideration reveals that logically, the theoretical constructs measured by growth mindset and difficulty-as-improvement scales are distinct. The first focuses on the belief that, with effort, they can (growth) or cannot (fixed) change. People who believe that with effort, they cannot change their intelligence or abilities (fixed mindset) should be more likely to try to ferret out and avoid situations in which they or others could discover that their intelligence or abilities are low (O'Donnell et al., 2023). Conversely, people who believe the opposite, that with effort their intelligence or abilities can change (growth mindset), may be less likely to endorse the idea of difficulty-as-impossibility – that difficulty signals that a task or goal is a waste of one's time (e.g., Oyserman & Destin, 2010). Believing that with effort one can change their intelligence or abilities (growth mindset) is distinct from believing that if a task or goal feels hard to think about or engage, that may signal its value (difficulty-as-importance) and from believing that if life feels difficult to think about or engage, that signals an opportunity to reveal a stronger, better character.

Indeed, empirically, Yan and colleagues (2024) found small-to-moderate sized correlations between endorsing a fixed mindset and endorsing difficulty-as-improvement (*r*s range from −.30 to .11) with the range including 0, small-sized correlations with difficulty-as-importance with the range including 0 (*r*s range from −.23 to .15), and moderate-to-large correlations with difficulty-as-impossibility (*r*s range from .38 to .70). This suggests that these constructs are distinct. Controlling for fixed mindset scores, difficulty-as-importance, difficulty-as-impossibility, and difficulty-as-improvement scores explained a statistically significant additional variance in virtuousness, conscientiousness, optimism, and meaning in life (Yan et al., 2024). We infer from these results that differences in difficulty-as-improvement scores are uniquely associated with these self-judgments, distinct from the contributions of difficulty-as-importance, difficulty-as-impossibility, and fixed mind-set scores.[2]

Evidence for recursivity and within-person variability

Empirically, difficulty-as-importance, difficulty-as-impossibility, and certainty of attaining one's academic possible identities are relatively stable across three measurements over three months (Burbidge et al., 2024). Regarding the recursivity, in the Burbidge and colleagues' study, students who felt more certain of attaining their academic possible identities were more likely at a later time to score higher in difficulty-as-importance (controlling for their prior endorsement). Parallelly, scoring higher in difficulty-as-importance increased the likelihood of subsequently feeling certain of attaining one's academic possible identities (controlling for their prior certainty). Evidence for within-person variability in endorsing difficulty-as-importance and difficulty-as-impossibility is indirect. It comes from experiments in which people are randomly assigned to contexts that make endorsing difficulty-as-importance or difficulty-as-impossibility more likely (Oyserman et al., 2015). And from experiments that randomly assign people to either

consider difficulty-as-importance or difficulty-as-impossibility and show differences in their subsequent certainty of attaining possible identities and task engagement (Aelenei et al., 2017; Oyserman et al., 2018; Smith & Oyserman, 2015). Regarding difficulty-as-improvement, research documents between-person differences but has not even indirectly addressed the prediction of within-person variability (for a review, Oyserman, 2024).

Believing unbidden life hardships elevate and sanctify

According to identity-based motivation theory, belief in the positive power of suffering and enduring is rooted in spiritual and religious worldviews (Oyserman, 2024). Indeed, religiosity is positively associated with endorsing the difficulty-as-improvement scale among American adults (Kiper et al., 2022). And, on average, more religious people and those living in China, India, Iran, and Turkey are more likely to agree with the idea that life's difficulties can improve character; in contrast, less religious people and those living in Australia, Canada, New Zealand, and the U.S. agree slightly (Yan et al., 2024). Yet this prior empirical research focused only on this construct's secular operationalization (Kiper et al., 2022, 2024; Yan et al., 2024). While we expect that secular and religious operationalizations of the scale yield parallel results, we specifically address this omission in the current studies by testing the prediction that secular and religiously worded scale versions converge.

The religious belief that enduring is sanctifying suggests that suffering can elevate character, purify, and reveal a better self. Indeed, people who score higher on the secular difficulty-as-improvement scale report better character (e.g., higher conscientiousness and more character virtues across the eight countries described above, Yan et al., 2024). We infer that this belief is a culturally fluent way of making sense of suffering in these otherwise quite different societies. Identity-based motivation theory predicts that once available, the inference that suffering ennobles may carry over from metacognitive difficulty experienced when thinking about one's life to metacognitive difficulty when thinking about tasks and goals (Oyserman, 2024). Empirically, evidence that this is the case comes from studies in which college students were shown means to attain their possible identities in the domains of fitness, healthy weight, and academics (Kiper et al., 2024). Controlling for their difficulty-as-importance and difficulty-as-impossibility scores, students who scored higher in difficulty-as-improvement rated more effortful means as more effective and said they were likely to use them. These results support one part of the identity-based motivation theory prediction – that between-person differences carry over to a preference for doing things the harder way. They do not address the other part of the prediction that context matters in the form of meaningful within-person variability. In the current studies, we address this gap and the question of replicating effects using religious and secular scale versions.

Current studies

We followed Nezlek's (2012) recommendation to use previously developed scales where available and adapted items from trait scales for daily administration if a daily scale was not already available.

Pilot tests of discriminant validity

We started with two pilot convergent and discriminant validity studies to bolster prior evidence that trait difficulty-as-improvement is a distinct construct. All of our data are openly available at: https://osf.io/qs8dn/?view_only=b4c785b8ceb74adfa5f6d15473cfd040.

Adults on MTurk (total $N = 730$, 50% female) participated in November 2017 ($n = 345$) and January 2018 ($n = 385$). About half (51.6%) of participants identified as Democrats (27.8% as Republicans, 20.5% chose the something else response). They were on the liberal side of the scale ($M = 3.44$, 1 = very liberal to 7 = very conservative). About half (46.4%) identified as Christian (most of the others identified as agnostic, 21%, or atheist, 21%) and on the less religious side ($M = 2.54$ on a scale from 1 = not at all religious to 6 = very religious).

We obtained responses to seven predictors and two predicted variables. Predictors were (1) difficulty-as-improvement, (2) difficulty-as-importance, (3) difficulty-as-impossibility, (4) ease-as-possibility, and (5) ease-as-triviality; all 4-item scales from Fisher and Oyserman (2017), (6) Cacioppo et al.'s (1984) 18-item need for cognition scale, and (7) Dweck's (2000) 8-item growth/fixed mindset scale. Our predicted variables were the 9-item John and Srivastava (1999) conscientiousness and the 8-item Duckworth and Quinn (2009) grit scale. Though highly correlated, conscientiousness and grit are potentially distinct constructs describing a trait of following through on commitments (Hagen & Solem, 2021; Ponnock et al., 2020; Schmidt et al., 2018). As detailed in Supplemental Materials (Pilot Studies 1–2), our November and January data collection episodes differed somewhat in item wording, response scales, and scale order of presentation.

We ran linear regressions. Then we followed Westfall et al.'s (2016) recommendation of using structural equation modeling to examine results for evidence of the incremental validity of difficulty-as-improvement. We detail methods and results in Supplemental Materials (Pilot Studies 1–2). Our linear regressions (controlling for the seven other predictors and the data collection episode) revealed a significant association between difficulty-as-improvement scores and our predicted variables: conscientiousness (first regression) and grit scores (second regression). Our two follow-up structural equation models revealed the incremental validity of difficulty-as-improvement. In our first SEM, difficulty-as-improvement uniquely contributed to variance in conscientiousness both before and after applying a Bonferroni correction and controlling for the data collection episode, difficulty-as-importance, difficulty-as-impossibility, ease-as-possibility, ease-as-triviality, need for cognition, and growth/fixed mindset. In our second SEM, difficulty-as-improvement uniquely contributed to the prediction of grit before applying a Bonferroni correction. We conclude that difficulty-as-improvement is distinct from growth/fixed mindset, need for cognition, difficulty-as-importance, difficulty-as-impossibility, ease-as-possibility, and ease-as-triviality.

Predictions

We make six predictions. H1, H2, and H3 focus on the religious version of the trait scale to replicate and extend prior between-person research using the scale's secular version. H4, H5, and H6 focus on daily fluctuations. Studies 1 to 4 assess H2 to H6; Study 4 assesses H1.

H1 (trait scale)

People respond analogously to the difficulty-as-improvement trait-level scale whether the scale items are worded secularly ("improve") or religiously ("purify"); i.e., scores on the two scales highly correlate.

H2 (trait scale)

Difficulty-as-improvement varies more at the between-person level than at the within-person level, though remaining meaningful at the within-person level.

H3 (trait scale)

People who score higher on trait difficulty-as-improvement also report greater trait-level well-being: they perceive their lives as having (a) meaning and (b) coherence, and themselves as having (c) personal worth (self-esteem), and they (d) feel more satisfied with their lives.

H4 (daily scale)

People who endorse trait difficulty-as-improvement experience greater daily well-being operationalized as (a) meaning in life, (b) coherence, (c) feelings of self-esteem, and (d) life satisfaction. They also take congruent action, operationalized as (e) engaging in daily effortful strategies more and have congruent outcomes operationalized as (f) experience more daily successes in possible identity-relevant domains.

H5 (daily scale)

Daily difficulty-as-improvement is associated with daily well-being even controlling for daily positive and negative events. On days people endorse difficulty-as-improvement more compared to their two-week average, they are more likely to report experiencing (a) meaning in life, (b) coherence, (c) self-esteem, and (d) life satisfaction. And they are more likely to report (e) engaging in effortful strategies and (f) experiencing successes.

H6 (daily scale lagged effects)

Yesterday's difficulty-as-improvement is associated with today's well-being, controlling for yesterday's well-being. The day after endorsing difficulty-as-improvement more compared to their two-week average, people experience more (a) meaning in life, (b) coherence, (c) self-esteem, and (d) life satisfaction, and they report (e) engaging more in effortful strategies, and (f) experiencing more daily success.

Method

Open science framework

Study 1 revealed the feasibility of our diary approach in our population. We pre-registered Studies 2–4. Pre-registrations, measures, data, and R scripts are available at: https://osf.io/qs8dn/?view_only=b4c785b8ceb74adfa5f6d15473cfd040.

Sample

Each 14-day diary study occurred in a different semester with different participants who received subject pool course credit (final $N = 382$; race-ethnicity was diverse, with a little more than a third describing themselves as Asian or Asian American, about a third describing themselves as White, and a final third included participants describing themselves as Hispanic or Black or other less frequent group descriptions, all of which are fully detailed by study in see Table S1 in Supplemental Materials). Study 1 (AY 2018–2019 2nd semester, $n = 96$, 76% female, $M_{age} = 20.17$), Study 2 (AY 2019–2020 1st semester, $n = 147$, 79% female, $M_{age} = 19.91$), and Study 3 (AY 2019–2020 2nd semester, $n = 59$, 66% female, $M_{age} = 20.47$) took place just before the COVID-19 pandemic closed universities and subject pools. Study 4 started once campus life returned (AY 2021–2022 2nd semester, $n = 80$, 68% female, $M_{age} = 20.71$).

Power and stop rules

We pre-registered Studies 2 to 4 with the plan of collecting as large a sample as possible, given the size constraints of our participant pool. We wrote our pre-registrations at the study level and show the study-level patterns for H1 to H3. However, our attained sample size each semester means that each study is underpowered at the between-person level (.39, .55, .26, and .33, respectively). To address this power issue, we examine our trait predictions by combining all data: A sensitivity analysis indicated that by doing so, we were adequately powered (.80) to detect between-person correlations as small as $r = .14$ and powered at .92 to detect the smallest significant between-person correlation that we report, of $r = .17$. Hence, we aggregated the datasets and ran analyses on this combined dataset. We present these, and by-study analyses in figure form in the paper (details in Supplemental Materials).

Our H4 to H6 within-person analyses are powered at the study level (.99, 1.00, .94, and .97, respectively). To provide a robust picture, we used the above-described by-study followed by aggregate result presentation for within-person analyses (see Fabrigar & Wegener, 2016). The size of our aggregated dataset was well above the recommendations by Nezlek (2012) and Maas and Hox (2005) for within-person analyses in daily diary studies. Within-person power analyses indicated we achieved 1.00 power to detect relationships between daily difficulty-as-improvement and daily successes, which was the smallest effect we detected (details, Supplemental Materials, see also Bolger et al., 2012).

Data exclusions

We prepared data for analysis following Nezlek (2012) and Meade and Craig (2012). Thus, we excluded participants with fewer than five daily entries, multiple entries completed the same day or after 10:00 a.m. the following morning, and incorrect answers to instructed response items. As detailed in Supplemental Materials, these criteria retained 94.96% of all daily entries (excluded $n = 246$ of 4880, final $N = 4634$; $M = 12.33$ reports per participant).

Procedure

Students watched an instructional video before starting and received an e-mail each evening at 9:00 pm for 14 days with a link to the daily survey to complete as close to bedtime as possible. Students completed the trait measures in two randomized chunks in Studies 1 to 3 (half before and the other half after the diary portion of the study) and in a single chunk in Study 4 (before the diary study). Our rationale for dividing the survey into two chunks was so students could complete it without experiencing fatigue; our rationale for randomized order was to reduce the chance of spurious correlations. We did not expect order to matter, and it did not (see Supplemental Materials, Exploratory Analyses).

Measures

We used the response options and scale names provided by the original scales' authors. Because presenting only scale names without scale items can invite jingle-jangle issues in which people reason from construct names rather than their item-bound operationalizations, we provide our full set of items rather than a sample item from each scale. We do so in text if feasible and in Table form if needed for clarity. We also include the response options, sample size, descriptive information, and reliability.

Difficulty-as-improvement (4-item, Yan et al., 2024; 3-item daily, study developed)

Table 1, left column, presents the items for the trait difficulty-as-improvement scales (religious version, Studies 1 to 4, and secular version, Study 4), and Table 1, right column, presents the day scale items (the difficulties that occurred on that day). Participants could report not experiencing any difficulty. On 88.164% of daily entries, they reported experiencing any difficulty, we treated the other 11.836% of entries as missing in difficulty-as-improvement analyses.

Table 1. Studies 1–4 trait and daily difficulty-as-improvement: religious (secular study 4) scale items.

Trait Difficulty-as-Improvement	Daily Difficulty-as-Improvement
In a way, the struggles you have today purify (*strengthen*) your character to meet tomorrow's challenges.	In a way, the struggles I had today will purify (*strengthen*) my character to meet tomorrow's challenges.
Every difficulty you overcome makes your spirit and soul grow stronger (*makes you grow stronger*).	Every difficulty I overcame today will make my spirit and soul grow stronger (*make me grow stronger*).
Difficulty is the strongest of teachers; difficulty might bend or break you temporarily, but it can purify (*strengthen*) you in the long run.	The difficulties I experienced today might bend or break me temporarily, but they can purify (*strengthen*) me in the long run.
Your spiritual journey through life (*journey through life*) cannot be complete without adversity, hardship, and overcoming suffering.	

The italicized text in parentheses is the secular wording used in Study 4. Responses rated on 1 = Strongly disagree to 6=Strongly agree; in the daily measure only, they could also select 7 = I did not experience any difficulties today (7 scored as NA). Religious version of the trait difficulty-as-improvement scale: Studies 1–4 $N = 381$, $\alpha = .86$, $M = 4.70$, $SD = 0.91$; Study 1 $\alpha = .89$, $M = 4.50$, $SD = 1.00$; Study 2 $\alpha = .84$, $M = 4.75$, $SD = 0.87$; Study 3 $\alpha = .84$, $M = 4.72$, $SD = 0.99$; Study 4 $\alpha = .85$, $M = 4.83$, $SD = 0.79$. Secular version of the trait difficulty-as-improvement scale: Study 4 n=80, $\alpha = .89$, $M = 4.90$, $SD = 0.74$. Religious version of the daily difficulty-as-improvement scale: Studies 1–3 number of daily reports = 3284, reliability = .80, within-person variability = 0.57, between-person variability = 0.98, $ICC = .63$, $M = 4.32$, $SD = 1.25$; Study 1 reliability = .82, $ICC = .68$, $M = 4.15$, $SD = 1.34$; Study 2 reliability = .81, $ICC = .60$, $M = 4.36$, $SD = 1.23$; Study 3 reliability = .74, $ICC = .59$, $M = 4.49$, $SD = 1.10$. Secular version of the daily difficulty-as-improvement scale: Study 4 number of daily reports = 798, reliability = .87, within-person variability = 0.52, between-person variability = 0.73, $ICC = .58$, $M = 4.71$, $SD = 1.13$.

Well-Being

We assessed the four aspects of well-being detailed next, providing the full set of items for each measure except the most common of them, the Rosenberg self-esteem scale.

Coherence was assessed as a trait with the 4-item Costin and Vignoles (2020) scale, with its original (1=Strongly disagree, 7=Strongly agree) response set. Items were: "I can make sense of the things that happen in my life." "Looking at my life as a whole, things seem clear to me." "I can understand why the events in my life have occurred." "My life feels like a sequence of unconnected events." This last item was reverse-coded and inadvertently omitted from Study 4. Trait coherence (4-item scale) Studies 1–3 $N = 300$, $\alpha = .74$, $M = 5.01$, $SD = 1.05$; Study 1 $\alpha = .80$, $M = 4.89$, $SD = 1.10$; Study 2 $\alpha = .72$, $M = 4.98$, $SD = 1.02$; Study 3 $\alpha = .68$, $M = 5.31$, $SD = 1.00$; 3-item scale Study 4 $n = 80$, $\alpha = .88$, $M = 4.93$, $SD = 1.28$. Daily coherence was assessed with a 3-study-developed scale using the original 1 to 7 response set. Items were: "I can make sense of the things that happen in my life today." "Looking at my life today, things seem clear to me." "I can understand why the events of my day have occurred." Studies 1–4 4630 daily reports, reliability = .80, within-person variability = 0.91, between-person variability = 0.95, $ICC = .51$, $M = 4.85$, $SD = 1.37$; Study 1 reliability = .79, $ICC = .44$, $M = 4.74$, $SD = 1.40$; Study 2 reliability = .82, $ICC = .51$, $M = 4.79$, $SD = 1.38$; Study 3 reliability = .74, $ICC = .50$, $M = 4.90$, $SD = 1.29$; Study 4 reliability = .82, $ICC = .60$, $M = 5.05$, $SD = 1.37$.

Satisfaction with life was assessed using the 5-item Diener et al. (1985), 1=Strongly disagree, 7=Strongly agree) trait scale. Items were: "In most ways, my life is close to my ideal." "The conditions of my life are excellent." "I am satisfied with my life." "So far, I have gotten the important things I want in life." "If I could live my life over, I would change almost nothing." Studies 1–4 $N = 380$, $\alpha = .88$, $M = 4.54$, $SD = 1.36$; Study 1 $\alpha = .87$, $M = 4.45$, $SD = 1.33$; Study 2 $\alpha = .89$, $M = 4.43$, $SD = 1.44$; Study 3 $\alpha = .88$, $M = 4.73$, $SD = 1.41$; Study 4 $\alpha = .85$, $M = 4.72$, $SD = 1.19$. Daily state was assessed with the Busseri and Newman (2022), pp. 1-item: "How satisfied were you with your life today?" 1=Not at all, 7=Very satisfied). Studies 1–4 4627 daily reports, within-person variability = 1.37, between-person variability = 1.16, $ICC = .46$, $M = 4.65$, $SD = 1.59$; Study 1 $ICC = .43$, $M = 4.67$, $SD = 1.63$; Study 2 $ICC = .47$, $M = 4.65$, $SD = 1.59$; Study 3 $ICC = .42$, $M = 4.69$, $SD = 1.56$; Study 4 $ICC = .51$, $M = 4.61$, $SD = 1.59$.

Meaning in life was assessed using the trait Meaning-in-Life Questionnaire (Steger et al., 2006, . 5-item presence subscale) with a 1=Absolutely untrue to 7=Absolutely true response scale. Items were: "I understand my life's meaning." "My life has a clear sense of purpose." "I have a good sense of what makes my life meaningful." "I have discovered a satisfying life purpose." "My life has no clear purpose." (R). Studies 1–4 $N = 381$, $\alpha = .89$, $M = 4.68$, $SD = 1.27$; Study 1 $\alpha = .90$, $M = 4.51$, $SD = 1.35$; Study 2 $\alpha = .87$, $M = 4.57$, $SD = 1.23$; Study 3 $\alpha = .88$, $M = 4.92$, $SD = 1.19$; Study 4 $\alpha = .90$, $M = 4.89$, $SD = 1.25$. Daily state was assessed with the 2-item Kashdan and Nezlek (2012) scale ("How meaningful did you feel your life was today?" "How much did you feel your life had purpose today?," 1=Not at all to 7=Very much). Studies 1–4 4630 daily reports, reliability = .87, within-person variability = 1.24, between-person variability = 1.44, $ICC = .54$, $M = 4.24$, $SD = 1.65$; Study 1 reliability = .87, $ICC = .50$, $M = 4.19$, $SD = 1.67$; Study 2 reliability = .87, $ICC = .54$, $M = 4.15$, $SD = 1.66$; Study 3 reliability = .86, $ICC = .56$, $M = 4.16$, $SD = 1.66$; Study 4 reliability = .88, $ICC = .57$, $M = 4.57$, $SD = 1.53$.

Self-esteem was assessed as a trait with Rosenberg's (1965) 10-item scale (1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree). Studies 1–4 $N = 381$, $\alpha = .89$, $M = 2.89$, $SD = 0.53$; Study 1 $\alpha = .91$, $M = 2.88$, $SD = 0.59$; Study 2 $\alpha = .90$, $M = 2.88$, $SD = 0.54$; Study 3 α

= .87, *M* = 3.00, *SD* = 0.49; Study 4 *α* = .86, *M* = 2.84, *SD* = 0.48. Daily self-esteem was assessed with the 4-item Nezlek (2005) scale (reponse options: 1=Very uncharacteristic, 7=Very characteristic of me). The items were: "Today I felt like a failure." (R) "Today, I felt that I had many good qualities." "Today, I thought I was no good at all." (R). "Today, on the whole, I was satisfied with myself." Studies 1–4 4629 daily reports, reliability = .59, within-person variability = 0.99, between-person variability = 0.96, *ICC* = .49, *M* = 4.99, *SD* = 1.41; Study 1 reliability = .57, *ICC* = .47, *M* = 4.92, *SD* = 1.42; Study 2 reliability = .60, *ICC* = .48, *M* = 4.98, *SD* = 1.42; Study 3 reliability = .55, *ICC* = .48, *M* = 5.10, *SD* = 1.33; Study 4 reliability = .65, *ICC* = .55, *M* = 5.00, *SD* = 1.42.

Daily effortful engagement checklist

Checklists do not have reliability (e.g., Stone et al., 1991). We developed a checklist starting with the stem "Today, I . . . " and the response options: 0= did not occur, 1 = occurred and not important, 2 = occurred and somewhat important, 3 = occurred and pretty important, and 4= occurred and extremely important. Items were: "Engaged in a difficult social interaction (e.g., with a stranger, with someone I feel awkward around, or on a topic that was difficult to discuss)." "Engaged with difficult schoolwork or homework, or went to a difficult class." "Engaged with a difficult health or fitness routine or did strenuous exercise." "Engaged in another type of difficult activity (not listed above) in a domain that I care about." "Did schoolwork the hard way (e.g., I took notes, I read the assignments before class)." "Took the high road to engage in a health or fitness goal (e.g., figuring out a way to have balanced nutrition even if it slowed down progress on my health and fitness goals)." The checklist was inadvertently omitted in Study 1, and the item wording was somewhat revised in Study 4 (see Supplemental Materials, Studies 1–4 Method). The aggregate number of daily reports across Studies 2–4 is 3,484, within-person variability = 0.35, between-person variability = 0.28, *ICC* = .45, *M* = 1.00, *SD* = 0.79; Study 2 *ICC* = .42, *M* = 0.94, *SD* = 0.72; Study 3 *ICC* = .50, *M* = 1.02, *SD* = 0.78; Study 4 *ICC* = .43, *M* = 1.11, *SD* = 0.92.

Daily checklists of successes, positive events, and negative events

Checklists do not have reliability. We adapted the checklists of Butler et al. (1994) and Nezlek and Plesko (2001) to assess daily events. They use the same response scale as the *Effortful Engagement Checklist*. We present these items in a Table form to facilitate direct comparison, as items varied somewhat in each study. Table 2

Table 2. Studies 2 to 4: daily successes checklist items.

Study 1. Today, I . . .	Studies 2 and 3. Today I . . .	Study 4. Today, I . . .
Completed work on an interesting project or assignment.	Succeeded in a social goal (e.g., making new friends, making a good impression).	Succeeded in a social goal (e.g., making new friends, making a good impression).
Met a daily fitness goal.	Succeeded at a work or school task.	Succeeded at a work or school task.
Performed well (sports, music, speaking, drama, etc.).	Succeeded in a health or fitness goal.	Succeeded in a health or fitness goal.
Got caught up (or ahead) in coursework or work duties.		Succeeded in another type of task or goal (not listed above) in a domain that I care about.
Did well on a school or work task (e.g., test, assignment, job duty).		

presents items for Daily Success. Studies 1–4 4632 daily reports, within-person variability = 0.52, between-person variability = 0.43, *ICC* = .45, *M* = 1.21, *SD* = 0.98; Study 1 *ICC* = .43, *M* = 0.97, *SD* = 0.89; Study 2 *ICC* = .43, *M* = 1.19, *SD* = 0.96; Study 3 *ICC* = .46, *M* = 1.33, *SD* = 0.98; Study 4 *ICC* = .45, *M* = 1.48, *SD* = 1.05. Table 3 presents items for Daily Positive events (omitted in Study 4). Studies 1–3 3722 daily reports, within-person variability = 0.43, between-person variability = 0.46, *ICC* = .51, *M* = 1.43, *SD* = 0.95; Study 1 *ICC* = .51, *M* = 0.96, *SD* = 0.80; Study 2 *ICC* = .41, *M* = 1.59, *SD* = 0.93; Study 3 *ICC* = .50, *M* = 1.76, *SD* = 0.93. Table 4 presents items for Daily Negative Events (omitted in Study 4). Daily negative events checklist: Studies 1–3 3722 daily reports, within-person variability = 0.34, between-person variability = 0.21, *ICC* = .39, *M* = 0.57, *SD* = 0.74; Study 1 *ICC* = .62, *M* = 0.40, *SD* = 0.62; Study 2 *ICC* = .28, *M* = 0.64, *SD* = 0.76; Study 3 *ICC* = .36, *M* = 0.67, *SD* = 0.80.

Analysis plan

We used package *psych* (Revelle, 2024) for descriptive statistics and package *lme4* (v. 1.1–23; Bates et al., 2015) for multilevel models in the R (v. 4.1.2) programming language (R Core Team, 2021). We computed day-measure reliability per Nezlek (2012) by creating three-level models, nesting the items of each scale within days and days within persons. The estimate of true variance over total variance comes from the null model intercept. We

Table 3. Studies 1–3: daily positive events checklist items by study.

Study 1. Today, I . . .	Studies 2 and 3. Today I . . .
Had especially good interactions with friends or acquaintances	Had a pleasant interaction with friends, family, or a romantic interest.
Went out socializing with friends/date (e.g., party, dance club).	Had a pleasant experience concerning performance at school or work.
Had especially good interactions with my steady date.	Had a pleasant experience regarding my health and fitness (e.g., was complimented on my fitness).
Did something special for a friend/steady date which was appreciated.	
Flirted with someone or arranged a date.	
A classmate, teacher, co-worker, or friend complimented me on my abilities.	
Went out to eat with a friend/date.	
Had another type of pleasant event (not listed above) with friends, family, or date.	

Table 4. Studies 1–3: daily negative events checklist items by study.

Study 1. Today, I . . .	Studies 2 and 3. Today I . . .
Did something awkward or embarrassing in a social situation.	Had an unpleasant interaction with friends, family, or a romantic interest.
Was excluded or left out by my group of friends.	Had an unpleasant experience concerning performance at school or work.
A disagreement with a close friend or steady date was left unresolved	Had an unpleasant experience regarding my health and fitness (e.g., a negative comparison or comment).
Classmate, teacher, co-worker, or friend criticized me on my abilities	
Got along poorly with peers (e.g., classmates, co-workers, roommates).	
Had plans fall through to spend time with someone special.	

used two-level multilevel models (nesting days within persons) to test our predictions. Per Nezlek (2012), we included random intercepts and random slopes in each model and trimmed the error term if the model failed to converge due to a lack of variation in the random effects. Following Rights and Sterba (2019, 2021) we calculated effect sizes using the *r2mlm* function (Shaw et al., 2023), which provides a measure that is akin to a correlation when the square root is computed (the square root of the proportion of variance reduction, Hox, 2002; Kreft & de Leeuw, 1998; Raudenbush & Bryk, 2002). We report R_b^{f2} (the square root of the proportion of between-cluster variance explained by between-person predictors via fixed slopes) for between-person models and R_w^{f1v} (the square root of the proportion of within-cluster variance explained by within-person predictors via fixed slopes and random slope variation/covariation) for within-person models. We interpret effect sizes using Cohen's (1988) rule of thumb for interpreting Pearson's *r* (.10 small; .30 moderate; and ≥ .50 large). We present graphically to synthesize focus on predictions across studies (e.g., Wickham, 2016).

Results

H1 predicts that people's responses to the religious and secular versions of the difficulty-as-improvement scale are analogous. Indeed, they are functionally equivalent, r=.82, 95% CI [.73, .88], $p < .001$, applying Kline's (2011) discriminant validity cutoff rule of $r < .85$ and Campbell and Fiske's (1959) related constructs rule of converging patterns of correlation (Table S2, Supplemental Materials). We use the term difficulty-as-improvement going forward to discuss the scale, whether the religious (Studies 1 to 3) or the secular (Study 4) version was used.

H2 predicts that difficulty-as-improvement is more trait-like than state-like. Supporting H2, the variance in daily difficulty-as-improvement scores attributable to between-person differences ranges from 58% to 68%. This information is detailed in the notes to Table 1. Supplemental Materials provide our fully unconditional multilevel models to test H2. Descriptively, this between-person range is higher than that of the other constructs we measure and is closest to the range for meaning in life as detailed in the descriptive information provided with each scale.

H3 predicts and Figure 1 graphically displays an association between trait difficulty-as-improvement and trait well-being. Our linear regressions with standardized variables across the aggregated dataset with three dummy-coded study variables as controls, support this prediction. In our synthesized dataset, trait difficulty-as-improvement was positively related to trait meaning in life (H3a; r=.35, 95% CI [.25, .44], $p < .001$), life coherence (H3b; r=.23, 95% CI [.13, .33], $p < .001$), self-esteem (H3c; r=.19, 95% CI [.09, .29], $p < .001$), and satisfaction with life (H3d; r=.17, 95% CI [.07, .27], p=.001). Though underpowered, associations are consistent at the level of individual studies.

H4 predicts and Figures 2 and 3 graphically display an association between trait difficulty-as-improvement and daily measures. We tested this by creating two-level models with daily well-being or experience as the outcome and trait difficulty-as-improvement as an uncentered level-2 predictor (equations, Appendix A). Supporting H4, aggregated analyses (blue triangles, Figures 2 and 3), revealed that people higher in trait difficulty-as-improvement were more likely to experience daily meaning in life (H4a; b =.34, t = 4.98, $p < .001$, $R_b^{f2} = 0.29$), life coherence (H4b; b =.25, t =4.52, $p < .001$, $R_b^{f2} = 0.27$), self-esteem (H4c; b =.17, t = 2.88, p = .004, $R_b^{f2} = 0.16$), and life satisfaction (H4d; b =.17, t = 2.65, p =

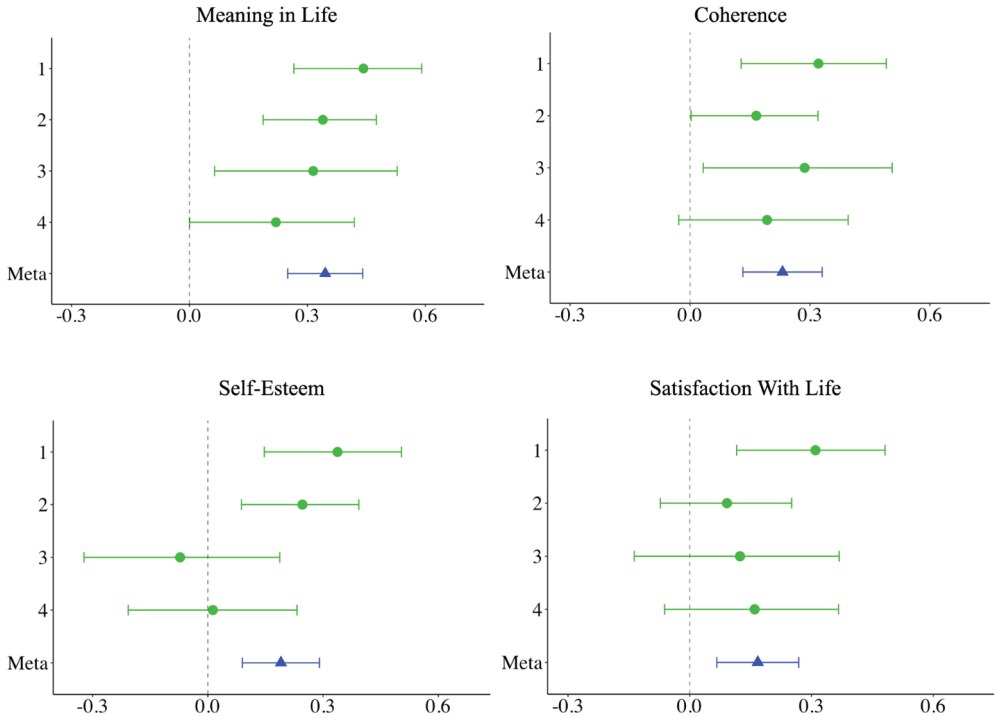

Figure 1. Trait difficulty-as-improvement is correlated with trait wellbeing. The x-axes represent the magnitude of the correlation between each outcome and trait difficulty-as-improvement. Y-axes represent the Study (circles) and meta-analytic (triangle) results. Whiskers represent 95% Confidence Intervals. The geometric shape represents the mean association. Table S2 in Supplemental Materials provides details.

.009, $R_b^{f2} = 0.14$), use effortful strategies (H4e; b =.14, t =3.86, $p < .001$, $R_b^{f2} = 0.27$) and experience successes (H4f; b =.16, t =4.22, $p < .001$, $R_b^{f2} = 0.34$).[3]

H5 predicts and Figures 4–7 graphically display that today's difficulty-as-improvement predicts today's well-being and daily experiences (with and without positive and negative daily event controls). To test this, we created six two-level models with daily difficulty-as-improvement (centered around each individual's mean) as the level-1 predictor (equations, Appendix B) and a daily well-being or experience variable as the outcome. Results support H5, with aggregated results displayed as blue triangles and study-level results as green circles in Figures 4–7. On days people endorsed difficulty-as-improvement more strongly compared to their two-week average, they experienced greater meaning in life (H5a; b=.41, t=12.98, $p < .001$; $R_w^{f1v} = 0.34$), life coherence (H5b; b=.36, t=11.75, $p < .001$; $R_w^{f1v} = 0.40$), self-esteem (H5c; b= .32, t=9.96, $p < .001$; $R_w^{f1v} = 0.35$), and life satisfaction (H5d; b=.39, t=10.85, $p < .001$; $R_w^{f1v} = 0.34$). These patterns are robust to adding daily positive and negative events as controls (meaning in life b=.32, t=9.45, $p < .001$; $R_w^{f1v} = 0.28$; life coherence b=.33, t=10.17, $p < .001$; $R_w^{f1v} = 0.32$; self-esteem b= .24, t=7.36, $p < .001$; $R_w^{f1v} = 0.28$; life satisfaction b=.27, t=7.45, $p < .001$; $R_w^{f1v} = 0.27$).

On days people endorsed difficulty-as-improvement more strongly compared to their two-week average, they also engaged in effortful strategies (H5e; b = .13, t =

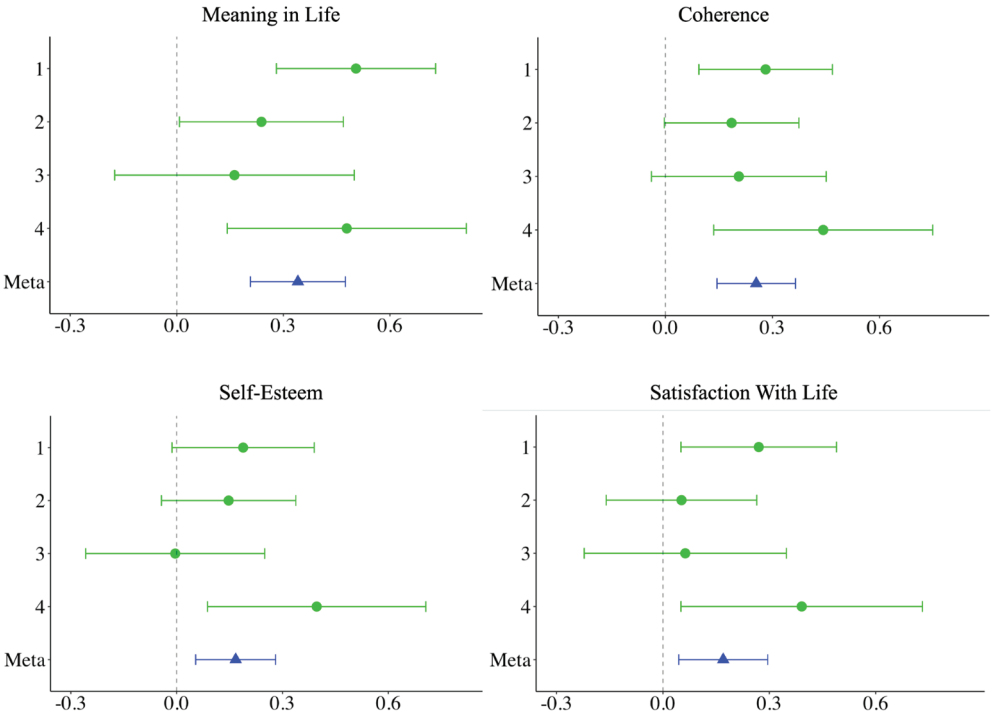

Figure 2. Trait difficulty-as-improvement predicts daily wellbeing. *Note*.The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent the Study (circles) and meta-analytic (triangle) results. In Studies 1-3 we used the religious version of trait difficulty-as-improvement and the secular version in Study 4. For numeric 95% confidence intervals, see Table S3 Supplemental Materials).

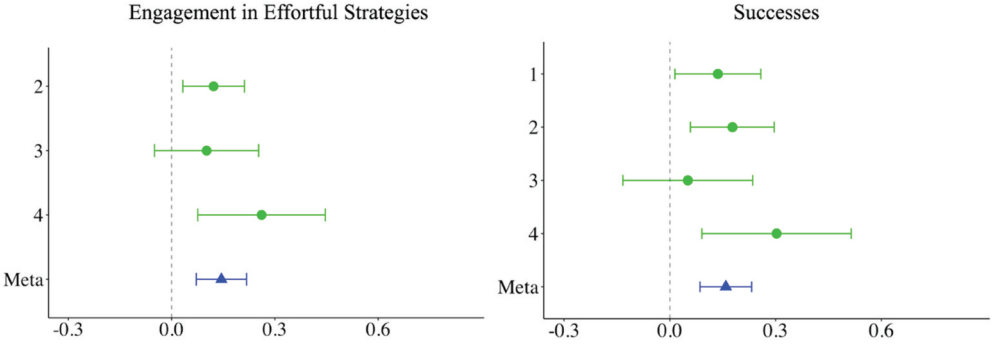

Figure 3. Trait difficulty-as-improvement predicts daily Experiences. *Note*.The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent the Study (circles) and meta-analytic (triangle) results. We included a religious version of trait difficulty-as-improvement in Studies 1 to 3 and the secular version in Study 4. See Table S3 for numeric representations of 95% confidence intervals represented here as whiskers and other details. We did not collect Engagement in Effortful Strategies responses in Study 1.

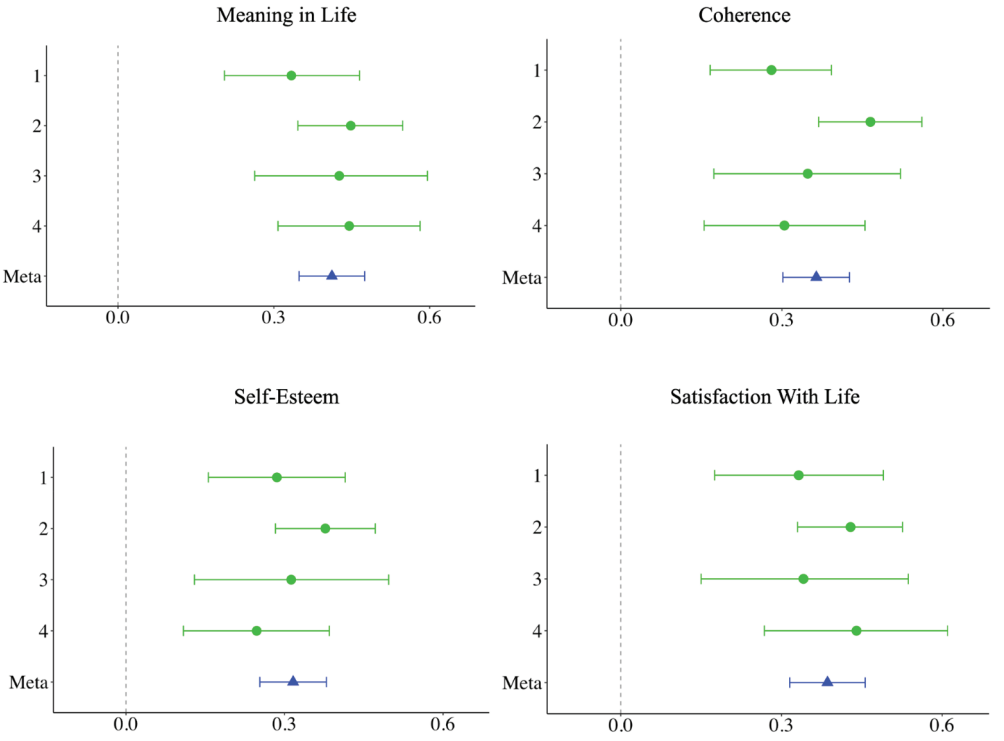

Figure 4. Daily difficulty-as-improvement predicts daily wellbeing (without daily event Controls). *Note*. The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent the Study (circles) and meta-analytic (triangle) results. Table S4 (Supplemental Materials) provides 95% confidence intervals with numeric upper and lower bounds. We also ran fixed slope models without daily event controls, as an additional test, the results of which can be seen in Table S5 in Supplemental Materials. The findings are similar.

7.80, $p < .001$; $R_w^{f1v} = 0.21$) and experienced successes (H5f; b = .15, t = 8.19, $p < .001$; $R_w^{f1v} = 0.20$) more compared to their two-week average. These patterns are robust, remaining when we add daily positive and negative events as controls (meaning in life b = .32, t =9.45, $p < .001$; $R_w^{f1v} = 0.28$; life coherence b = .33, t = 10.17, $p < .001$; $R_w^{f1v} = 0.32$; self-esteem b = .24, t = 7.36, $p < .001$; $R_w^{f1v} = 0.28$; life satisfaction b = .27, t = 7.45, $p < .001$; $R_w^{f1v} = 0.27$; engagement in effortful strategies b = .06, t = 3.69, $p < .001$; $R_w^{f1v} = 0.50$; successes b = .06, t = 3.33, $p = .001$; $R_w^{f1v} = 0.64$). Results are consistent in each study for each outcome, except daily successes.

H6 predicts lagged effects, that yesterday's difficulty-as-improvement predicts today's well-being and experiences, as Figures 8 and 9 depict, we find partial support for this prediction. We tested H6 by examining the relationship between yesterday's difficulty-as-improvement and today's well-being, controlling for yesterday's well-being, and the lagged relationships in the reverse direction. In both model sets, we centered level-1 predictors around each individual's mean with no person-level predictors (equations Appendix C, by-study results Supplemental Materials, Table S6). We do not report effect sizes for models with multiple predictors (see Rights & Sterba, 2019).

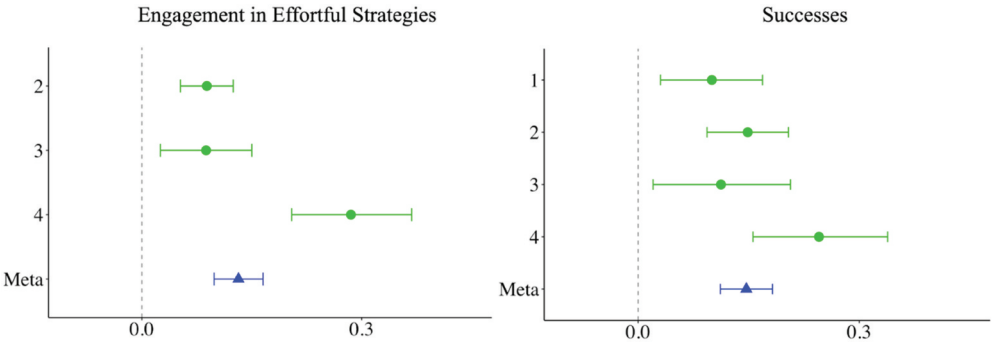

Figure 5. Daily difficulty-as-improvement predicts daily experiences (without daily event controls). Note. The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent the Study (circles) and meta-analytic (triangle) results. Table S4 (Supplemental Materials) provides 95% confidence intervals with numeric upper and lower bounds. Study 1 did not collect Engage in Effortful Strategies. We also ran fixed slope models without daily event controls, as an additional test, the results of which can be seen in Table S5 in Supplemental Materials. The findings are similar.

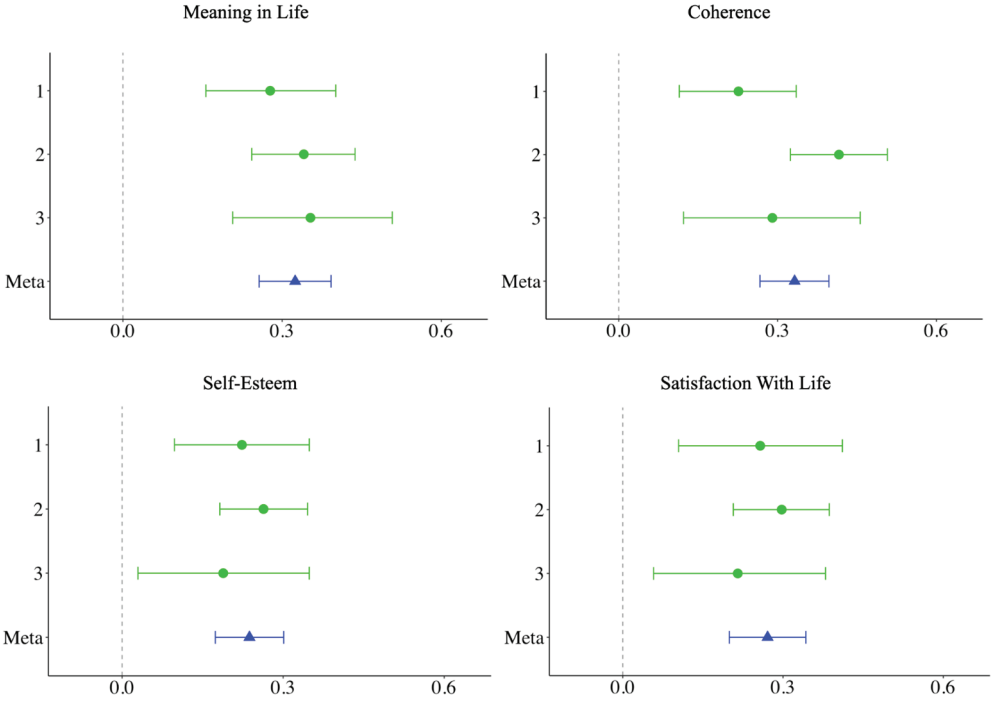

Figure 6. Daily difficulty-as-improvement predicts daily wellbeing (with daily event controls). *Note*. We did not measure daily positive and negative events in Study 4. The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent Study (circles) and meta-analytic (triangle) results. Table S4 (Supplemental Materials) provides 95% CIs with numeric upper and lower bounds.

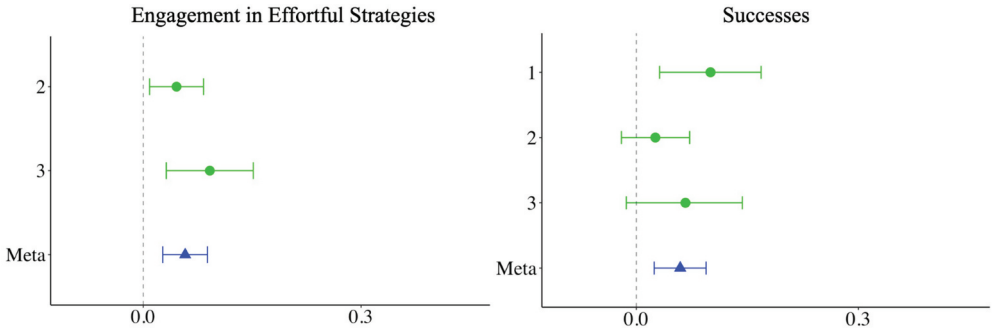

Figure 7. Daily difficulty-as-improvement predicts daily experiences (with daily event Controls). *Note.* The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent the Study (circles) and meta-analytic (triangle) results. Table S4 (Supplemental Materials) provides 95% confidence intervals with numeric upper and lower bounds. Study 1 did not collect Engage in Effortful Strategies.

We found partial support for H6 (triangles in Figures 8 and 9), difficulty-as-improvement significantly predicted greater meaning in life (H6a; b=.07, t=2.32, p=.021) and self-esteem (H6c; b=.06, t=2.32, p=.021) the next day, controlling for the present day's well-being. The lagged relationships between difficulty-as-improvement and life coherence (H6b; b=.04, t=1.70, p=.091) and life satisfaction (H6d; b=.05, t=1.60, p=.112) were not significant though directionally consistent. The lagged relationships with engaging in effortful strategies (H6e; b=.02, t=1.31, p=.191) or experiencing successes (H6f; b=.02, t = 0.87, p = .385) was near 0 and not significant. At the level of each study, we did not find a consistent non-zero-overlapping confidence interval pattern for any lagged relationship. We also looked for reverse-lagged relationships as a robustness check, finding that yesterday's well-being and daily activities did not predict today's difficulty-as-improvement, with the exception that yesterday's coherence predicted today's difficulty-as-improvement (b=.05, t = 2.71, p=.007; details in Supplemental Materials Table S10).

Pre-registered exploratory analyses of religion and religious practice

Given prior associations between religiosity and difficulty-as-improvement, we pre-registered exploratory analyses as detailed in Supplemental Materials Table S11. Religious people were modestly more likely to endorse difficulty-as-improvement (both assessed as traits, meta-analytic r = .17, t = 3.35, p < .001), and people endorsed difficulty-as-improvement more on days they participated in religious activities (meta-analytic b = 0.08, t = 2.37, p = .019). However, trait difficulty-as-improvement was not significantly associated with engaging in religious activity on any given day (meta-analytic b = 0.05, t = 1.26, p = .210). These results imply that religious activities and beliefs may modestly boost difficulty-as-improvement beliefs rather than the reverse.

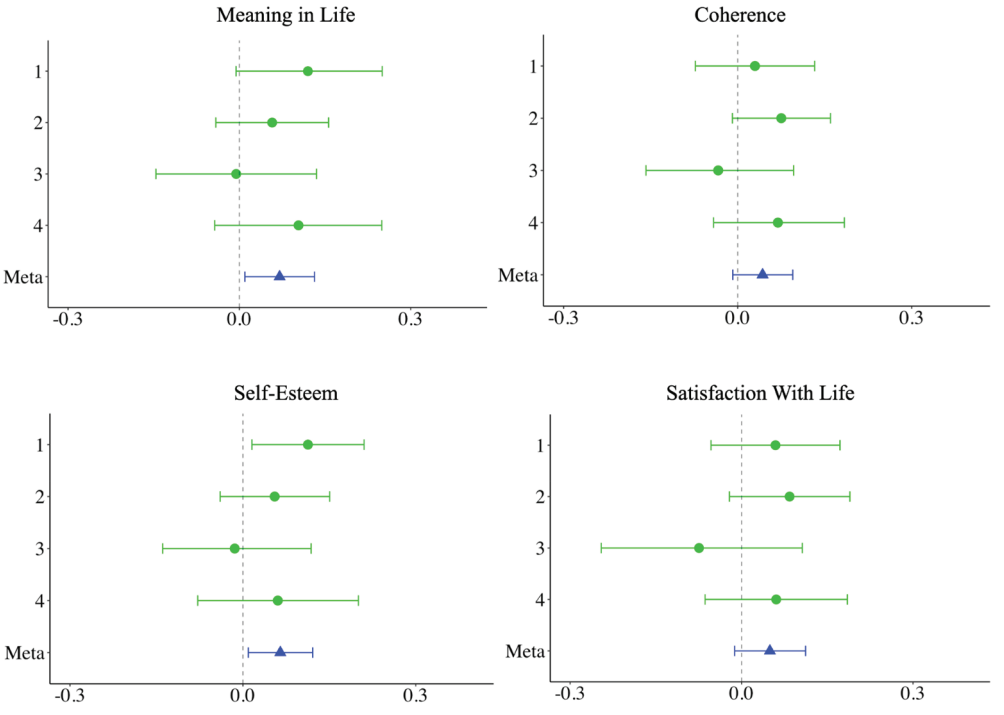

Figure 8. H6: Yesterday's difficulty-as-improvement predicts Today's meaning in life and self-esteem (with Controls). *Note.* The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent the Study (circles) and meta-analytic (triangle) results. Table S6 (Supplemental Materials) provides 95% confidence intervals with numeric upper and lower bounds. As additional tests, we ran fixed slope models with controls (Table S7 in Supplemental Materials), random slope models without controls (Table S8 in Supplemental Materials), and fixed slope models without controls (Table S9 in Supplemental Materials). The findings are similar.

General discussion

People vary in how much they believe that enduring life difficulties can support their spirit and character, whether measured with secular (character) or religious (spiritual growth) wording. Variance in daily difficulty-as-improvement scores is attributable to between-person more than within-person fluctuations. People's trait-level difficulty-as-improvement scores are associated with their trait and daily well-being, their daily use of effortful strategies, and their daily successes. But people also vary meaningfully across days in how much they endorse difficulty-as-improvement. Regardless of their general tendency, on days people endorse difficulty-as-improvement more compared to their two-week average, they report more meaning in life, coherence, self-esteem, and life satisfaction, engage more in effortful strategies, and are more likely to report experiencing successes. Each of these associations is moderate in size. Finally, in aggregate analyses, yesterday's higher difficulty-as-improvement predicts today's higher meaning in life and self-esteem. More research is needed to understand lagged impacts.

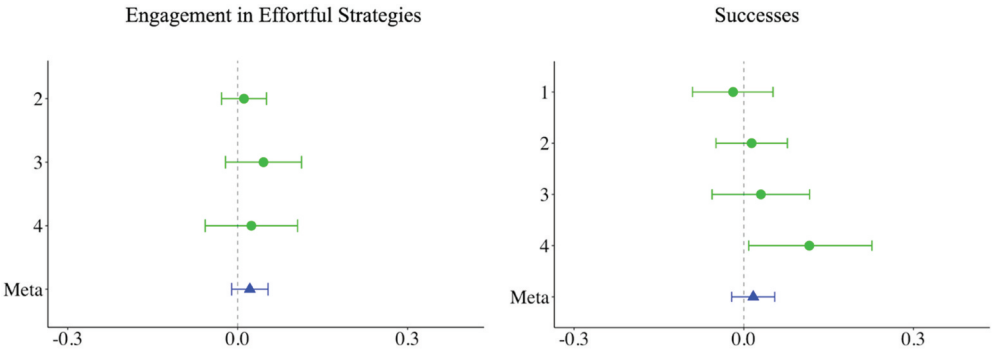

Figure 9. H6: Yesterday's difficulty-as-improvement predicts Today's wellbeing (with Controls). Note. The x-axes represent the magnitude of the unstandardized regression coefficient of trait difficulty-as-improvement for each outcome. Y-axes represent the Study (circles) and meta-analytic (triangle) results. Table S6 (Supplemental Materials) provides 95% confidence intervals with numeric upper and lower bounds. Study 1 did not collect Engage in Effortful Strategies. As additional tests, we ran fixed slope models with controls (Table S7 in Supplemental Materials), random slope models without controls (Table S8 in Supplemental Materials), and fixed slope models without controls (Table S9 in Supplemental Materials). The findings are similar.

Theoretical implications

Our results have implications for identity and well-being theorizing. Regarding identity, we advance theorizing on how identity-based motivation works by using a diary method. We document that difficulty-as-improvement meaningfully fluctuates and that these fluctuations matter. In doing so, we build on two sets of studies. The first set of studies documents small-to-moderate associations between difficulty-as-improvement beliefs and a carryover to preference for using effortful means to attain academic, physical fitness, and ideal weight possible future identities (Kiper et al., 2024). The second set of studies documents small-to-moderate associations between difficulty-as-improvement beliefs and well-being in adult samples in Australia, Canada, China, India, Iran, New Zealand, Turkey, and the U.S Yan et al., 2024.

Our results add to the finding linking difficulty-as-improvement to a carryover preference for effortful means of possible identity goal attainment by documenting that, even controlling for the day's general positivity or negativity, when daily difficulty-as-improvement is higher, people are more likely to use effortful strategies to pursue their daily goals. We infer that difficulty-as-improvement beliefs may carry over to effortful engagement with daily tasks and goals. Our results also add to the well-being literature as our studies suggest that associations with well-being are robust to using secular or religious wording in the difficulty-as-improvement measure and generalize to a broad conceptualization of well-being as meaning in life, life satisfaction, life coherence, and self-esteem.

Prior research links positive mental health to experiencing meaning in life and coherence (Schäfer et al., 2019; Winger et al., 2016) and to higher self-esteem and life satisfaction (Lewinsohn et al., 1991; Park, 2004; Sowislo & Orth, 2013). Moving beyond static associations, we show that difficulty-as-improvement beliefs are associated with everyday well-being and self-regard. We find meaningful within-person and between-person

variability in difficulty-as-improvement and document that on days that people are higher than their average endorsement on difficulty-as-improvement beliefs, they are also higher than their average in meaning in life, life satisfaction, life coherence, and self-esteem. We found preliminary evidence that the temporal course is more from difficulty-as-improvement beliefs to well-being than the reverse. Our pre-registered exploratory analyses reveal an association between engaging in religious activities and believing in difficulty-as-improvement on any given day. In doing so, we add to the literature describing antecedents of meaning and coherence in life, life satisfaction, and self-esteem, and to the literature on how religiosity relates to physical and mental health (e.g., Hoogeveen et al., 2023).

We find evidence that between-person differences and within-person variability in difficulty-as-improvement are positively associated with a preference for doing things the hard way and experiencing daily successes. In doing so, our results suggest that effort is not always experienced negatively, even though it can be (Baars et al., 2020; Bjork, 1994; de Bruin et al., 2023; Feldon et al. 2019; Inzlicht et al., 2018). Our results also suggest a reason why effort itself may be moralized and perceived as a marker of character, linking to a related literature (Amos et al., 2019; Celnicker et al., 2023). Whether or not doing things the hard way increases the likelihood of success in a particular instance, a tendency to do so can be associated with higher self-esteem if others find effort a marker of good character, building on the Sociometer Theory of self-esteem as a social acceptance barometer (Baumeister et al., 2003; Leary & Baumeister, 2000). Indeed, people associate self-control with moral fiber (Mooijman et al., 2018).

Limitations and future directions

Each set of studies has limitations; here, we focus on limitations due to design, measurement, and sample. A strength of our design is that diary studies provide an ecologically valid approach to understanding how frequently people experience difficulty-as-improvement and how these beliefs matter in everyday life. We show that daily fluctuations occur and are associated with fluctuations in well-being and action. A daily diary design reveals natural salience and variability, it cannot address whether the process is causal. While silent as to whether difficulty-as-improvement naturally does come to mind, an experimental approach of making a difficulty-as-improvement mind-set accessible using an autobiographical recall task or a biased scale approach can test whether once brought to mind, difficulty-as-improvement causally shapes well-being or action. Future research could take up this next step.

Regarding measures, we used previously developed difficulty-as-improvement and well-being (meaning in life, coherence, self-esteem, and life satisfaction) measures. Measures behaved in our studies as in other studies using different populations, increasing our confidence in our findings. We were powered to test between-person effects at the aggregate, not the study level, so we cannot address questions of study-level variability, which may be due to power, measurement error, or the inherent variability of results. Regarding within-person fluctuations, though each study is powered, we are not powered to address whether study-level variability is due to power, measurement error, or the inherent variability of situated results. We used extant daily measures (creating the daily difficulty-as-improvement measure). We know that people were

more likely to endorse difficulty-as-improvement on days they engaged in religious activities. However, this does not preclude that other daily situations may evoke higher or lower than average day-level difficulty-as-improvement. Future studies could use ecological momentary assessment to obtain information about the nature of these other difficulty-as-improvement triggering or suppressing situations. Regarding identities, we showed that religious people were likelier to endorse difficulty-as-improvement on any given day. Future studies could measure other social identities to obtain a broader sense of the association between social or collective identities and endorsing difficulty-as-improvement. Given prior results (e.g., Yan et al., 2024), another candidate social identity could be identifying as a values conservative.

A final limitation of daily use measures is that the common psychometric tests for construct validity at the trait level are difficult and sometimes impossible to run in daily diary methods. In our case, while the incremental validity of the trait measure has been documented, it is particularly difficult to provide incremental validity over alternative constructs of the daily measure. A reader might wonder about the incremental validity of daily difficulty-as-improvement beliefs over other daily beliefs like a growth mindset. The strength of a daily method is that it highlights specific experiences. The problem in testing questions of incremental validity of daily constructs is that the relevant daily-level questions refer to different experiences. For instance, a daily growth mindset item could be "Your intelligence is something about you that you couldn't really change very much today." In contrast, daily difficulty-as-improvement items refer specifically to inferences from difficult situations, such as "The difficulties I experienced today might bend or break me temporarily, but they can purify me in the long run," and participants had the option of saying that nothing difficult had occurred that day. While individual difference measures lend themselves to incremental validity tests, daily constructs that differ in reference points do not lend themselves to these tests.

Turning to sample-based limitations, our sample was diverse – roughly a third described themselves as White or Euro-American, another third as Asian or Asian American, and the final third divided among people describing themselves as Hispanic/Latino, African American/Black, or other backgrounds. We were not powered to test differences by race-ethnicity, national heritage, religiosity, or other indicators, including family socioeconomic status and age. For two reasons, each might be a fruitful avenue for future research. First, Yan and colleagues (2024) documented that difficulty-as-improvement is higher among more religious people and people from more traditional cultures and cultures experiencing harsher environments in cross-national surveys. The implication is that people from different socio-economic and cultural heritage backgrounds in the U.S. might each arrive at difficulty-as-improvement beliefs through different socialization patterns. Second, while not yet studied, can people gain a sense that when life feels hard to think about suffering must be endured but that character improves as a results in two ways: retrospectively, as they look back on their lives, or prospectively, as they look forward to their possible future lives and imagine difficulties to be endured.

Conclusion

People who believe that when life is difficult to experience, that signals that enduring hardships can make one a better, more mature person and build character (higher

difficulty-as-improvement scorers) also tend to score higher on difficulty-as-improvement on any given day. Both the former (trait) and the latter (daily) measures matter. Higher scorers rate their lives more positively, engage in effortful strategies, and report experiencing more daily successes. Since positive self-regard and finding meaning in life are each associated with being in better health, the implication is that believing that when life is hard to think about, hardships can build character (and hence are good for something) may be protective of mental and physical health.

Notes

1. These analyses employ a structural equation model including time of data collection and political conservatism as controls, and difficulty-as-improvement, difficulty-as-importance, and difficulty-as-impossibility as predictors.
2. Research studying growth mindset often uses only the fixed mind-, set items, reverse-scored (e.g., Yan & Scheutze, 2023). Yan et al., 2024 followed this convention in seven countries. They used both fixed and growth items in Chin however because prior studies suggested that in China, the growth mindset and fixed mindset items do not load on the same factor. As reported by O'Donnell et al. (2023), this separation in factor structure is not uncommon in other settings when both growth and fixed items are measured. This is also what Yan and colleagues (2024) report in their Chinese data, fixed and growth mindset items did not load onto the same factor and in their Chinese sample, endorsing difficulty-as-improvement and endorsing a growth mindset were correlated at a moderate-sized correlation ($r = .42$, $p < .001$), yielding an inference that the two constructs are distinct.
3. Each study is underpowered alone, Study 3 results could be due to sampling variability.

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Ethics Statement including IRB and Informed Consent

The studies were conducted at USC, the USC IRB UP-19-00500 Daily Diary Study: State and Trait Measures was approved via exempt review on 7/26/2019. Participants read the informed consent that informed them of the voluntary nature of starting and continuing, the possibility of skipping any question, and contact information (for us and the IRB). They clicked to acknowledge. Consent included the publication of data without student identification.

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Appendices

Appendix A

Day level: y_{ij} (outcome variable) = $\beta_{0j} + r_{ij}$
Person level: $\beta_{0j} = \gamma_{00} + \gamma_{01}$ (trait difficulty-as-improvement)$_j + u_{0j}$

Where, y_{ij} is the 'j'th person's score on the outcome variable on the 'i'th day; β_{0j} is the jth person's 2-week average outcome score; and r_{ij} is the level-1 random error term. γ_{00} is the grand mean for the outcome score; γ_{10} is the regression coefficient of trait difficulty-as-improvement; and u_{0j} is the deviation of the mean outcome score of the jth person from the grand mean.

Appendix B

Daily difficulty-as-improvement entered as the level-1 predictor, centered around each individual's mean where:

Day level: y_{ij} (outcome variable) = $\beta_{0j} + \beta_{1j}$(difficulty-as-improvement)$_{ij} + r_{ij}$
Person level: $\beta_{0j} = \gamma_{00} + u_{0j}$
$\beta_{1j} = \gamma_{10} + u_{1j}$

Appendix C

Lagged relationship from difficulty-as-improvement to well-being/experience:
Day level: y_{ij} (well-being/experience day n) = $\beta_{0j} + \beta_{1j}$(difficulty-as-improvement day n-1)$_{ij} + \beta_{2j}$(well-being/experience day n-1)$_{ij} + r_{ij}$
Lagged relationship from well-being/experience to difficulty-as-improvement:
Day level: y_{ij} (difficulty-as-improvement day n) = $\beta_{0j} + \beta_{1j}$(difficulty-as-improvement day n-1)$_{ij} + \beta_{2j}$(well-being/experience day n-1)$_{ij} + r_{ij}$