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ORIGINAL PAPER

When bigger is better: size of strategy repertoire predicts goal attainment

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Abstract
People are highly motivated to change their behavior. Unfortunately, many people have difficulty doing so. Building on recent theorizing, we propose that having a larger strategy repertoire (or strategy "toolbox") can help people achieve their goals. In eight samples across several domains, participants ($N_{\text{total}} = 2347$) reported their use of seven strategies that determined their strategy repertoire for a particular goal. Findings indicated that having a larger strategy repertoire predicted goal attainment. These findings replicated across domains (healthy eating, academic performance, saving money), among self-set personal goals, at both the between-person and within-person levels, and were robust to different operationalizations of strategy repertoire, but differed by behavior. Specifically, having a larger strategy repertoire was associated with better subjective goal progress, healthier eating, and more adaptive financial behaviors, but not snack intake or subjective credit score. Together, these findings highlight that having a larger strategy "toolbox" may have important implications for downstream regulation processes, which sets the stage for lasting behavior change.

Keywords Strategy repertoire · Self-regulation · Goal attainment · Self-control · Regulatory flexibility

If you have ever tried to change your behavior—whether you wanted to jumpstart a new fitness routine, be more productive at work, or increase your retirement savings—you probably received no shortage of advice on how to succeed. Indeed, the range of behavior change strategies is vast (Duckworth et al., 2019; Knittle et al., 2020), and there is growing appreciation that people use a wide range of strategies to try to achieve their goals (Aldao et al., 2015; Bonanno & Burton, 2013; Ford et al., 2019; Werner & Ford, 2023). Much of the research to date has centered on the important issue of determining which strategies are most effective (e.g., Hennecke et al., 2019; Katzir et al., 2021). However, key questions also remain regarding the benefits of having access to a wide range of strategies (*how broadly does strategy repertoire benefit different facets of goal attainment?*), their generalizability (*how generalizable are the benefits of strategy repertoire across domains?*), and their measurement (*what is the best way to measure strategy repertoire?*).

We propose that people who have access to a wide range of strategies—that is, people who have a large strategy repertoire (or strategy "toolbox")—are more likely to achieve their goals than people with a smaller strategy repertoire. At first glance, it may seem paradoxical that having a larger strategy repertoire would be beneficial, as it previously has been suggested that having more paths to a goal can "dilute" the effectiveness of each individual strategy (e.g., Kruglanski et al., 2002). However, both theory and initial findings suggest that having a larger strategy repertoire can provide people with the requisite tools to navigate the multitude of experiences they are likely to encounter in daily life, which can increase goal commitment (Kruglanski et al., 2011) and ultimately help them achieve their goals in the long run (Werner & Ford, 2023).

Although there has been some theorizing regarding the role of strategy repertoire during goal pursuit (e.g., Fujita et al., 2020; Werner & Ford, 2023), little empirical research has directly tested whether having a larger strategy repertoire can

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help people achieve their goals. In the present investigation, we sought to test this foundational assumption by examining strategy repertoire across several important life domains where people commonly rely on strategies to change their behavior—including the health domain (e.g., de Vet et al., 2014), the academic domain (e.g., Duckworth et al., 2019), and the financial domain (e.g., Peetz & Davydenko, 2022).

The role of strategy repertoire

Strategy repertoire has historical roots in the study of coping (e.g., Bonanno et al., 2004; Pearlin & Schooler, 1978) and emotion regulation (e.g., Bonanno & Burton, 2013; Gross, 2015), where it has been defined as "the ability to utilize a wide range of regulatory strategies that might accommodate divergent contextual demands and opportunities" (Bonanno & Burton, 2013, p. 594). Adapting this construct to other forms of regulation, we define strategy repertoire as "the strategies a person generally has at their disposal in the pursuit of a particular goal" (Werner & Ford, 2023, p. 5). In a metaphorical sense, strategy repertoire can best be thought of as a "toolbox." Much like a carpenter needs to have a range of tools to carry out their work successfully, a person's strategy repertoire represents their regulatory "toolbox", and the individual strategies represent the specific "tools" they can use to regulate their thoughts, emotions, and behaviors in different situations. Critically, the size of a person's strategy repertoire may have important implications for downstream regulatory processes, including how people use specific strategies in different contexts (Werner & Ford, 2023). In other words, having a larger strategy repertoire allows for the *possibility* to accommodate a wider range of situations people experience in daily life, whereas having access to a limited range of strategies would be akin to "[giving] a small boy a hammer, and he will find that everything he encounters needs pounding" (Kaplan, 1964, p. 28).

Despite the important role strategy repertoire can have in the regulation process, surprisingly little empirical research has examined whether having a larger strategy repertoire can help people achieve their goals. To advance our understanding of how broadly strategy repertoire may benefit goal attainment, we examined whether having a larger strategy repertoire is associated with different facets of goal attainment, including subjective goal progress and a variety of domain-specific behaviors.

Strategy repertoire and goal attainment across domains

A fundamental aspect of the human experience is that we are often juggling a variety of goals that we wish to achieve (e.g., Kruglanski et al., 2002; Kung & Scholer, 2020). Rarely is it the case that we focus on our goal to eat healthy, save money, or perform well at school in isolation. Rather, goals often operate simultaneously, at times in harmony, and other times in conflict (Inzlicht et al., 2021). Congruent with this idea, recent evidence suggests that goal pursuit is largely a within-person process (see Milyavskaya & Werner, 2018 for a detailed review). Considering a domain-specific approach for what strategies people have in their repertoire also makes intuitive sense, though the few studies that have indirectly tested this idea provide mixed results. On one hand, it has been proposed that people who are equipped with the right strategies should be successful in all domains, as these strategies should, in theory, be employable across domains (Mischel & Mendoza-Denton, 2003; Tsukayama et al., 2012). On the other hand, it has been proposed that how people regulate depends on the goal (Katzir et al., 2021; Tamir et al., 2020). In other words, people may have a different strategy repertoire for each of their goals, such as when regulating positive versus negative emotions (Heiy & Cheavens, 2014; Wen et al., 2021) or when managing different self-control conflicts (Bürgler et al., 2021).

Given that how people regulate can, at least in part, vary by domain, it is also important to consider whether strategy repertoire varies by domain. To advance our understanding of the generalizability of strategy repertoire in the context of goal pursuit, we examined whether the association between strategy repertoire and goal attainment generalizes across several important life domains, as well as within-person variation in strategy repertoire itself.

Conceptual challenges with measuring strategy repertoire

From a conceptual standpoint, adopting a toolbox approach to self-regulation seems simple; however, the real challenge is deciding what constitutes a well-equipped strategy repertoire (Kalokerinos & Koval, 2024). This is particularly challenging since the range of strategies is so vast that it is "dizzying in both number and variety" (Duckworth et al., 2019, p. 38). In recent studies, strategy lists can range from a few (e.g., Milyavskaya et al., 2021) to dozens (e.g., Hennecke et al., 2019), in part because strategies are often measured at different levels of analysis, ranging from broad strategy categories (e.g., "to change my environment") to domain-specific behavioral tactics (e.g., "do not buy unhealthy snacks at the grocery store"). Although this important work has revealed key insights for self-regulation, this variation in strategy measurement poses a challenge when trying to compare strategies across studies, especially those in different domains.

Perhaps unsurprisingly, there is also variation in how to operationalize strategy repertoire. The recent surge in research on dynamic regulation processes has led to the development of various methods to operationalize strategy repertoire and adjacent constructs, which has resulted in conceptual ambiguity (Gross, 2015; Werner & Ford, 2023), especially at the empirical level (Cheng et al., 2014; Werner et al., 2022). According to recent models of strategy use, strategy repertoire is one essential component of the regulation process that enables a person's capacity for regulatory flexibility (Bonanno & Burton, 2013). In other words, strategy repertoire represents the tools a person generally has at their disposal when pursuing their goals, which sets the stage for how people can then implement specific strategies in response to different situations they encounter in daily life (Werner & Ford, 2023). Despite this distinction, it is currently unclear how to best measure strategy repertoire, especially when considering that these processes (general strategy availability and situation-specific strategy use) are often conflated at the measurement level.

Although we can gain initial insights from research on emotion regulation (e.g., Bonanno et al., 2004; Wen et al., 2021), it is currently unclear how to operationalize strategy repertoire. To advance our understanding of how to best capture strategy repertoire in the context of goal pursuit, we employed a recently validated measure of strategies that can be applied across domains (Katzir et al., 2021). This measure is ideal for the current research because it measures a wide range of strategies derived from a thorough literature review on self-regulation that were identified as the primary strategies used in desire regulation across different domains (e.g., situation selection, self-reward, precommitment, distraction, cognitive change). For example, most strategies captured in this measure were derived from the process model (Gross, 2015; Werner & Ford, 2023), which was designed to help organize behavioral tactics into several commonly used strategy categories. Using this measure, we compared three of the most common and/or recently developed repertoire indices to determine (a) how much they overlap, and (b) whether the magnitude of the associations between strategy repertoire and goal attainment differs for each repertoire index.

Evidence supporting a toolbox approach to regulation

Although the broad concept of having a strategy toolbox to help people achieve their goals can be traced back to the early work of Walter Mischel (Mischel et al., 1989), only recently has it started to gain traction theoretically (e.g., Werner & Ford, 2023) and empirically (e.g., Bürgler et al., 2021). However, much can be learned from the fields of coping and emotion regulation, where nearly a decade of research suggests that having a larger strategy repertoire is beneficial. Across different samples, spanning many domains, and using diverse methodologies, having a larger strategy repertoire is associated with higher levels of well-being (e.g., Grommisch et al., 2020; Lougheed & Hollenstein, 2012), fewer symptoms of psychopathology (e.g., borderline personality symptoms, disordered eating symptoms; Dixon-Gordon et al., 2015; Southward et al., 2018), better emotion regulation (e.g., Heffer & Willoughby, 2017), and better adjustment following stressful and potentially traumatic life events (e.g., Bonanno et al., 2004). As an initial attempt at adapting strategy repertoire to the context of self-control, one recent study found that having a larger strategy repertoire was associated with how well people believed they managed self-control conflict and how satisfied they were in managing self-control conflict, but only for conflicts of inhibition and initiation, not persistence (Bürgler et al., 2021).

Building on these important foundations, the current investigation extends the concept of strategy repertoire to goal attainment more broadly. Although there is conceptual overlap in emotion regulation and goal pursuit (Gross, 2015; Werner & Ford, 2023), prior research has predominately focused on the benefits of strategy repertoire for mental health and well-being. Thus, the unique contributions of the current investigation are threefold. First, we examine how broadly strategy repertoire benefits different facets of goal attainment, including both subjective goal progress and behavioral indicators of goal attainment. Second, we examine whether the benefits of strategy repertoire generalize across several important life domains. Finally, we examine the robustness of the association between strategy repertoire and goal attainment by comparing different methods for operationalizing strategy repertoire.

The present research

The present research examined whether having a larger strategy repertoire can help people achieve their goals. Across eight samples ($N_{\text{total}} = 2347$) spanning several important life domains (i.e., health, academics, finances), we first established the association between strategy repertoire and different facets of goal attainment (Aim 1). To test the generalizability of our findings, we then compared the association between strategy repertoire and goal attainment across domains (Aim 2). To achieve these objectives, we used the recently validated Self-Control Strategy Scale (Katzir et al., 2021) to capture a person's strategy repertoire. We also assessed two complementary but distinct facets of goal attainment: (1) subjective progress (i.e., how much progress people feel they made on each goal), and (2) a series of domain-specific outcomes that capture specific goal-related behaviors (e.g., servings of fruits, vegetables, and snacks consumed in a week; adaptive financial behaviors). This approach allows us to conduct an internal meta-analysis to compare the general association between strategy repertoire and subjective goal progress across domains, as well as gain better insight into the specific goal-related behaviors people are doing in their everyday lives, above and beyond how well people generally *think* they are doing.

Finally, we also examined the robustness of the association between strategy repertoire and goal attainment by comparing different methods for operationalizing strategy repertoire (Aim 3). To achieve this objective, we compared three popular and/or recently developed indices that capture strategy repertoire—the distinct index, sum index, and diversity index. Each repertoire index includes at least one of two key components: (1) the number of strategies a person uses, and/or (2) the extent to which a person uses each strategy. Conceptually, the distinct index simply represents the number of tools a person has in their toolbox (e.g., Aldao & Nolen-Hoeksema, 2013), whereas the sum index and the diversity index were designed to capture different repertoire profiles based on the extent to which people use different strategies (e.g., Bonanno et al., 2011; Wen et al., 2021). Since research has yet to examine whether strategy repertoire is associated with goal attainment, we refrained from making a priori predictions about which index is best. Instead, we sought to determine how each index performs when predicting different facets of goal attainment across domains. Specifically, in the present research we assessed (a) how much the different repertoire indices overlap, and (b) whether the magnitude of the associations between strategy repertoire and goal attainment differs for each repertoire index.

Statement of transparency

To test our research questions, we primarily conducted secondary analyses using existing datasets collected as part of larger studies on goal pursuit. The one exception is Sample F, which we collected as a replication of Sample E to ensure we had two samples for each domain. The research questions and analyses were not pre-registered. However, since we had two samples for each domain, we adopted an exploratory-confirmatory approach to ensure that our findings were replicable across all samples and within each domain (see Carpenter & Law, 2021; Werner et al., 2019). All study materials, relevant data, statistical code, and supplementary materials are available on the Open Science Framework (OSF). Project link: osf.io/k4b7d.

Methods

Participants and procedure

Across eight samples (total $N = 2347$), participants were recruited from a psychology participant pool at different universities in Canada or Amazon's Mechanical Turk (MTurk) via CloudResearch (Litman et al., 2017). Demographics for all samples are summarized in Table 1. In most samples, participants completed an online survey about a single target goal, including the goal to eat healthy (Samples A–B), to achieve a desired semester GPA (Samples C–D), or to save money (Samples E–F). In two samples, participants completed a survey about multiple goals, one of which included all three domain-specific goals (Sample G) and the other including three self-set personal goals (Sample H). In all samples, participants completed a series of questionnaires about their experience in pursuing the target goal(s), including what strategies they generally use in response to temptations that conflict with the target goal and how much progress they made. For healthy eating (Samples A, B) and financial goals (Samples E–F), participants also completed measures of domain-specific behavioral outcomes indicative of goal progress (e.g., healthy and unhealthy food intake, financial behaviors). Finally, only people who were actively pursuing the target goal(s) in each sample were eligible to participate in the study.

Measures

Strategy repertoire

To assess the range of strategies people have at their disposal when pursuing the target goal, all participants completed the Self-Control Strategies Scale (Katzir et al., 2021). This measure consists of 38 items representing eight strategies, seven of which are used in the present analyses—situational strategies, reward, punishment, precommitment, attentional deployment, cognitive change, and acceptance. Although this scale also measures inhibition, the construct of inhibition (or "willpower") is so vague that it is likely not a strategy at all (Fujita et al., 2020; Gross & Duckworth, 2021; Werner et al., 2022). As a conservative approach to measuring strategy repertoire, we did not include inhibition in any of our primary analyses. Responses were made on a 1 (*strongly disagree*) to 7 (*strongly agree*) Likert scale. The items for each subscale were averaged together, with higher scores indicating that people were more likely to use that strategy.

Using the strategy subscales, we created a composite for each of the three strategy repertoire indices. See Fig. 1 for

Table 1 Demographic characteristics of individual samples

Characteristics	Sample A	Sample B	Sample C	Sample D	Sample E	Sample F	Sample G	Sample H
Domain	Healthy eating	Healthy eating	Academic	Academic	Finance	Finance	All domains	Self-set
Number of goals	1	1	1	1	1	1	3	3
Sample size (n)	227	280	230	305	407	285	371	242
Sample type	MTurk	Undergrad	Undergrad	Undergrad	MTurk	MTurk	Undergrad	MTurk
Age—M (SD)	36.33 (11.40)	20.21 (4.02)	20.58	18.82 (1.31)	36.80 (11.25)	38.34 (11.56)	20.15 (4.16)	36.61 (10.78)
Gender (%)								
Woman	46%	70%	65%	73%	51%	40%	59%	51%
Man	53%	29%	33%	27%	18%	58%	41%	48%
Not listed	1%	1%	2%	0%	1%	2%	0%	1%
Ethnicity (%)								
White	73%	56%	58%	13%	70%	78%	60%	74%
Black	14%	15%	14%	6%	18%	8%	11%	17%
Hispanic/Latino	8%	2%	3%	3%	5%	7%	2%	6%
Asian	7%	18%	16%	63%	7%	12%	18%	7%
Native American	–	< 1%	1%	0%	1%	1%	1%	< 1%
Other	< 1%	11%	12%	22%	1%	1%	11%	< 1%

For Sample G, participants reported on all three goals assessed in Samples A–F. The ethnicity column for each sample may total > 100% because participants were allowed to select more than one option

an overview of each index and their corresponding calculations. For the distinct index, we adapted the procedure from Aldao and Nolen-Hoeksema (2013) and dichotomized the strategy ratings. If the average of a strategy subscale was greater than 4 (i.e., ranging from slightly agree to strongly agree), we considered this strategy as likely to be used and was assigned a value of 1. If the average of a strategy subscale was 4 or less (i.e., ranging from neither agree nor disagree to strongly disagree), we considered this strategy as likely not being used and was assigned a value of 0. Repertoire size was calculated by summing the recoded values across the seven strategies (scores ranging from 0 to 7). The next two indices, the sum index and diversity index, were designed to capture strategy profiles representing both the number of strategies a person has available to them and the extent to which they are used. Specifically, the sum index was calculated by summing the average for each of the seven subscales (Bonanno et al., 2011), whereas the diversity index was adapted from the Shannon biodiversity index (Shannon, 1948) to overcome the mathematical limitations of the sum score (see Fig. 1; Wen et al., 2021).

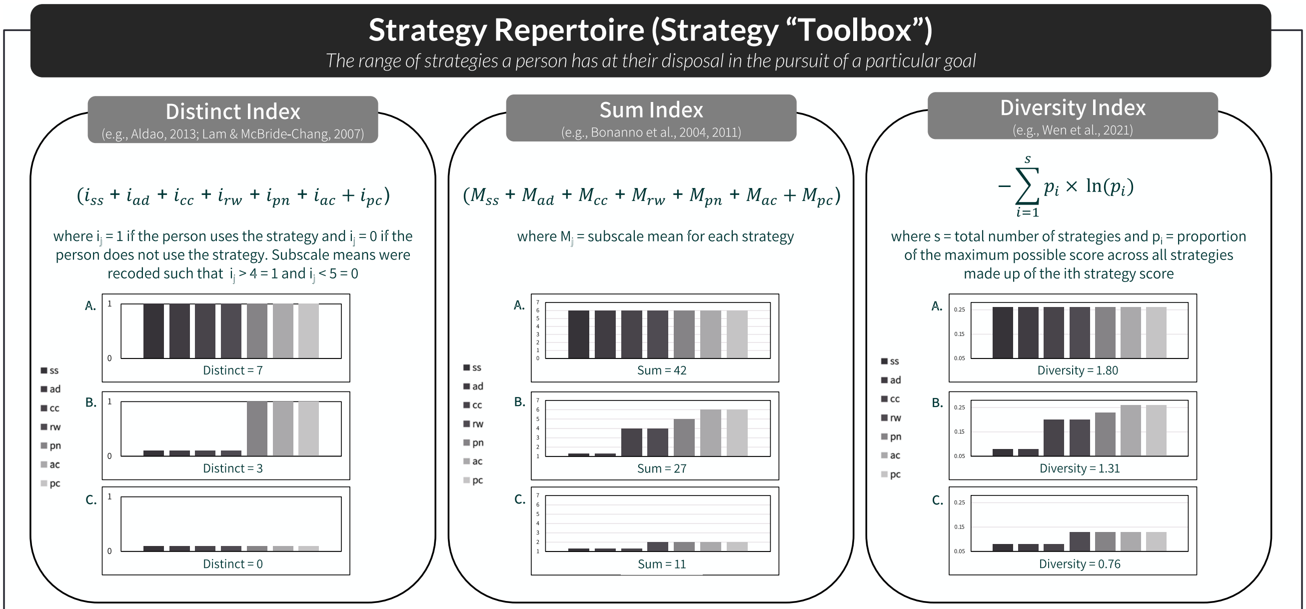
Subjective goal progress

In all samples, participants were asked to indicate how much progress they made using three items for each goal (e.g., Koestner et al., 2008; Werner et al., 2016): "I have made a lot of progress toward this goal", "I feel like I am on track with my goal plan", and "I feel like I have achieved this goal." Responses were made on a seven-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). All items were averaged together, with higher scores indicating people felt they made greater progress on their goal.

Domain-specific behavioral outcomes

In samples focusing on healthy eating (Samples A–B) and saving money (Samples E–F), participants were asked to complete measures of domain-specific outcomes that capture goal-related behaviors. Participants in Samples A and B completed an adapted version of the Dana-Farber Cancer Institute Eating Habits Questionnaire (n.d.), which measures food consumption in a typical week. As an indicator of healthy food intake, we averaged two items assessing the total servings of fruits and vegetables people consume in a typical week. As an indicator of unhealthy intake, participants indicated how many servings of high-fat/sugar snacks they consume in a typical week. Responses were made on a nine-point scale ranging from 1 (0 servings a week) to 9 (5 + servings per day).

Participants in Samples E and F completed the Financial Capability Scale (Collins & O'Rourke, 2013), which measures both their ability (2-items; e.g., "How confident are you in your ability to achieve a financial goal you set for yourself today?") and behaviors (4-items; e.g., "Do you currently have a personal budget, spending plan, or financial plan?) in effectively managing financial resources. For



Example	ss	ad	cc	rw	pn	ac	pc
A	6	6	6	6	6	6	6
B	1	1	4	4	5	6	6
C	1	1	1	2	2	2	2

Fig. 1 Descriptions and calculations for all strategy repertoire indices. *ss* situational strategies, *ad* attention deployment, *cc* cognitive change, *rw* reward, *pn* punishment, *ac* acceptance, and *pc* precommitment. Example graphs highlight the individual components of the related repertoire index calculation. Notably, the data points in the distinct index graphs represent the recoded scores for each strategy (0, 1), the data points in the sum index graphs represent the subscale means, and the data points in the diversity index graphs represent − 1 × [(M − 49) × ln (M − 49) for each strategy, where M = the subscale mean. Finally, Example A represents a person who uses all strategies to a high degree, Example B represents a person who uses some strategies to a moderate-high degree, and Example C represents a person who uses very few strategies at all

our primary analyses, we focused only on adaptive financial behaviors (see supplementary material for additional results). Response options differed between questions and were recoded based on the scale instructions. All items were summed together with higher scores indicating more adaptive financial behaviors. Finally, as an indicator of subjective credit score, participants were asked "how would you rate your current credit score?" Responses were made on a scale ranging from 1 (very bad) to 5 (very good). This item was measured separately as part of the Financial Capability Scale and was not included in the adaptive financial behaviors composite.

Analytic strategy

To address our research questions, we adopted a range of statistical methods that we describe in detail in the corresponding results sections below. Here, we describe the more general procedures that we followed throughout the analytical process. First, descriptive statistics for individual strategies in each of the eight samples are provided in supplementary material (Table 1S). Second, when describing results across multiple samples, we report the relevant statistics (e.g., Pearson's correlations) for each sample along with the average meta-analytic correlation. Third, in these cases where we could only include one statistic for each sample (e.g., internal meta-analyses; Goh et al., 2016), we aggregated across all goals to obtain a person's average for relevant measures (Samples G–H). This approach was further justified based on the intraclass correlations, which indicated that the majority of variance in relevant variables was at the between-person level (Fig. 4). Fourth, for primary analyses focusing only on samples where participants reported multiple goals (Samples G–H), we used multilevel modeling to account for goals being nested within people. Specifically, we modeled relevant associations at both the within-person (i.e., differences among a person's own goals) and between-person (i.e., individual differences across people) levels using MPlus v8.8 (Muthén & Muthén, 2017). Fifth, we report standardized results (e.g., STDYX standardization for multilevel models) whenever possible. Finally, we followed the guidelines of Funder and Ozer (2019) when interpreting effect sizes. Specifically, an effect size of r ranges from *very small* (0.05) to *small* (0.10) to *medium* (0.20) to *large* (0.30) to *very large* (0.40 or greater).

Results

How broadly does strategy repertoire benefit different facets of goal attainment?

Consistent with our first research aim, we examined whether having a larger strategy repertoire was associated with different facets of goal attainment. To achieve this objective, we first calculated the correlations between each repertoire index and (a) subjective goal progress, and (b) goal-specific outcomes. We then conducted a series of internal meta-analyses (Goh et al., 2016) to determine the average association for each repertoire index across all eight samples (Samples A–H). Notably, only one statistic from a given sample can be included in the meta-analyses (Goh et al., 2016). Since Samples G–H included multiple goals, for the following analyses we aggregated across all goals to obtain a person's average strategy repertoire and average subjective goal progress.

The link between strategy repertoire and subjective goal progress

First, we tested whether people with a larger strategy repertoire tended to report greater subjective goal progress *within each sample*. Pearson's correlations indicated that having a larger strategy repertoire was associated with greater subjective goal progress, with associations ranging from medium to very large in all samples. The same pattern of findings held across all three repertoire indices (Fig. 2). Although the association between strategy repertoire and subjective goal progress varied across samples (ranging between $r = 0.19$ and 0.55), the associations between each repertoire index and subjective goal progress were comparable within a given sample (e.g., for Sample A, the correlations for the distinct index, sum index, and diversity index were $r\text{s} = 0.21$, 0.22, and 0.19, respectively).

Next, we tested the average association between strategy repertoire and subjective goal progress *across all samples*. Results from an internal meta-analysis suggest that having a larger strategy repertoire was associated with greater subjective goal progress. The same pattern of findings held across all three repertoire indices, with associations ranging from large to very large for each index (meta-analytic rs ranging from 0.32 to 0.39; Fig. 2).

The link between strategy repertoire and domain-specific outcomes

First, we tested whether people with a larger strategy repertoire for the goal to eat healthy (Samples A–B) tended to report consuming more healthy food and less snacks. Pearson's correlations indicated that having a larger strategy repertoire was associated with consuming more healthy food, with associations ranging from medium to large across both samples (meta-analytic rs ranging from 0.20 to 0.27). Strategy repertoire was unrelated to snacking (meta-analytic rs ranging from − 0.03 to 0.00). The same pattern of findings held across all three repertoire indices (Fig. 3).

Next, we tested whether people with a larger strategy repertoire for the goal to save money (Samples E–F) tended to report more adaptive financial behaviors and a better subjective credit score. Pearson's correlations indicated that having a larger strategy repertoire was associated with engaging in more adaptive financial behaviors, with associations ranging from large to very large across both samples (meta-analytic rs ranging from 0.36 to 0.42). Strategy repertoire was unrelated to subjective credit score (meta-analytic rs ranging from 0.01 to 0.04). The same pattern of findings held across all three repertoire indices (Fig. 3).

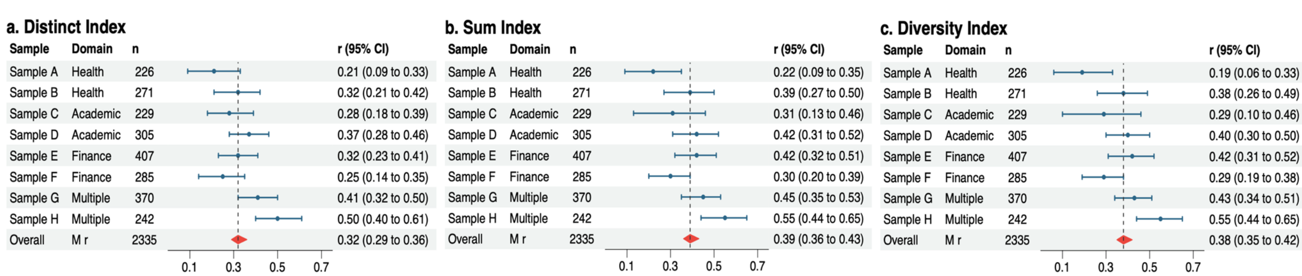


Fig. 2 Correlational and meta-analytic results between strategy repertoire indices and subjective goal progress across all samples (Samples A–H). To easily compare the individual effect sizes compared to the average, the dashed line in each meta-analysis represents the overall meta-analytic effect

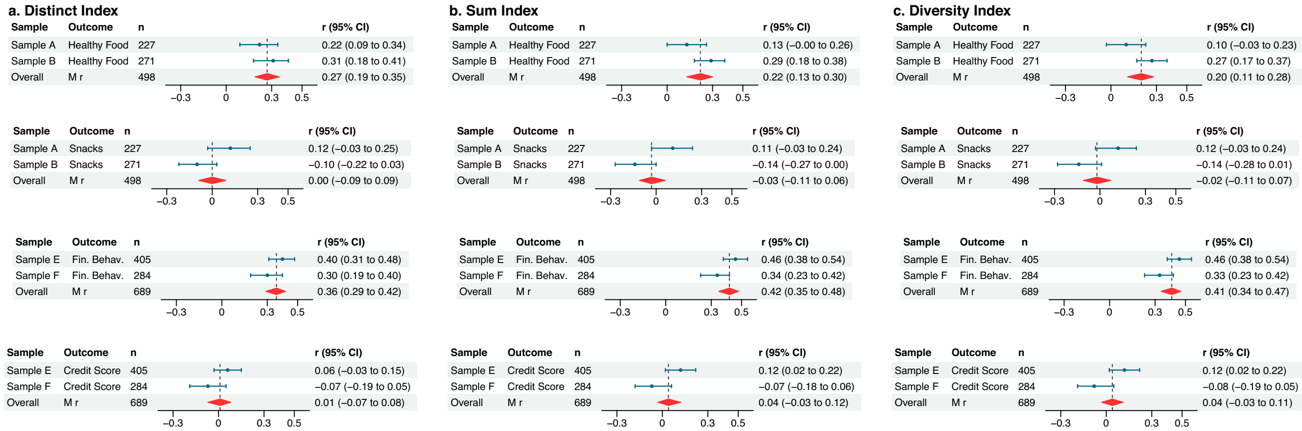


Fig. 3 Correlational and meta-analytics results between strategy repertoire indices and domain-specific behavioral outcomes (Samples A–B and E–F). The dashed line in each meta-analysis represents the overall meta-analytic effect. *Fin.Behav.* Adaptive financial behaviors

How generalizable are the benefits of strategy repertoire across domains?

To test our second research aim, we sought to further quantify whether the magnitude of the association between strategy repertoire and goal attainment differs across domains. To achieve this objective, we first compared the magnitude of the correlations between all repertoire indices and subjective goal progress across domains in the samples focusing on a single goal (Samples A–F). Specifically, this test compares the difference between two correlation coefficients from independent samples weighted by sample size (Soper, 2024). To capitalize on our two samples where people reported multiple goals (Samples G–H), we then examined (a) whether having a larger strategy repertoire within a particular domain was associated with better goal progress within that domain, and (b) whether people have similar strategy repertoires across domains.

Comparing the link between strategy repertoire and subjective goal progress across domains

First, we tested whether the magnitude of the correlations between strategy repertoire and subjective goal progress varied by domain. Results suggest the magnitude of the association between strategy repertoire and subjective goal progress was generally the same, regardless of whether a person was pursuing the goal to eat healthy, obtain a desired GPA, or save money. The same pattern of findings held across all three repertoire indices (Table 2).

Within-person variation in strategy repertoire

Next, we tested whether people varied in their strategy repertoire among their own goals. Intraclass correlations (ICC) indicated that the majority of variance in strategy repertoire was between-person (ranging between 71 and 82%), meaning that people generally had similar scores on each repertoire index across all three of their goals (e.g., people generally had a similarly sized repertoire for each goal). That said, there are likely slight differences among the size and/or content of a person's strategy repertoire, as a small proportion of variance was at the within-person level (ranging between 18 and 29% including error). The same pattern of findings held across all three repertoire indices (Fig. 4).

Within-person variation in the link between strategy repertoire and subjective goal progress

Finally, we tested whether having a larger strategy repertoire within a particular domain is associated with making greater progress in that domain. Results from multilevel analyses indicate that people with a larger strategy repertoire were more likely to make greater progress on their goals, *compared to other people*. Additionally, people with a larger strategy repertoire for a particular goal are more likely to make greater progress on that goal, *compared to their other goals*. The same pattern of findings held across all three repertoire indices and in both samples (Fig. 4).

What is the best way to measure strategy repertoire?

Our findings thus far suggest that all three repertoire indices perform the same when predicting goal attainment. Consistent with our third research aim, we sought to further quantify (a) how much the different repertoire indices overlap, and (b) whether the magnitude of the associations between strategy repertoire and goal attainment differs for each repertoire index. To achieve these objectives, we calculated the

Table 2 Results comparing the magnitude of the correlations between strategy repertoire and subjective goal progress across domains (Samples A–F)

Comparison	Predictor	Distinct Index				Sum Index				Diversity Index			
		M r	*n*	*z*	*p*	*M r*	*n*	*z*	*p*	*M r*	*n*	*z*	*p*
1	Health	0.27	497	–	–	0.32	497	–	–	0.30	497	–	–
	Academic	0.33	534	− 1.06	0.291	0.37	534	− 0.91	0.364	0.35	534	− 0.89	0.371
2	Health	0.27	497	–	–	0.32	497	–	–	0.30	497	–	–
	Finance	0.29	692	− 0.37	0.713	0.37	692	-0.96	0.336	0.37	692	− 1.33	0.181
3	Academic	0.33	534	–	–	0.37	534	–	–	0.35	534	–	–
	Finance	0.29	692	0.77	0.443	0.37	692	0.00	0.999	0.37	692	− 0.40	0.691

The average correlation (*M r*) for each domain was obtained using the internal meta-analysis spreadsheet (Goh et al., 2016), which calculated the weighted average of the two correlations from each set of domain-specific samples

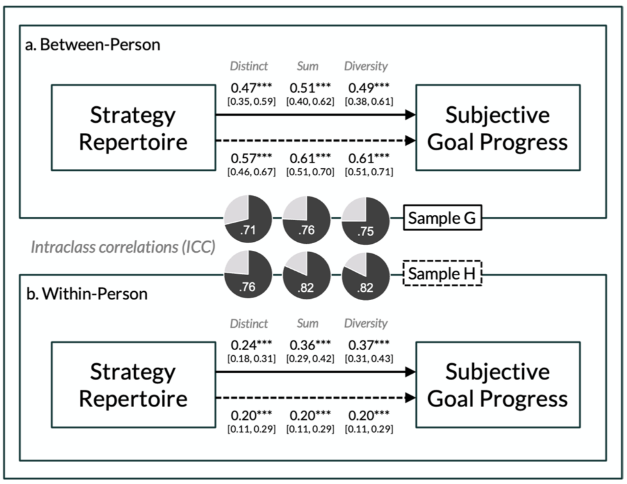


Fig. 4 Results from multilevel analyses with strategy repertoire predicting subjective goal progress (Samples G–H). Standardized (STDYX) results are reported. Separate models were conducted for each repertoire index. Results for Sample G (domain-specific goals) are represented by the solid lines and results for Sample H (self-set personal goals) are represented by the dashed lines. Intraclass correlations (ICCs) for both samples are represented in the pie charts, with the dark-shaded component representing the proportion of between-person variance and the light-shaded component representing the proportion of within-person variance including error

correlations between all repertoire indices for each sample and conducted a series of internal meta-analyses (Goh et al., 2016) to determine the average association for each repertoire index across all eight samples. We then compared the magnitude of the correlations between all repertoire indices and the different facets of goal attainment. Since we were comparing indices within the same samples, we tested the difference between two dependent correlations from the same sample with one variable in common (Lee & Preacher, 2013). This test allowed us to statistically compare the magnitude of the meta-analytic correlations for each pair of repertoire indices (i.e., distinct-sum, distinct-diversity, and sum-diversity) for each outcome.

Comparing the overlap among repertoire indices

First, we tested the degree of overlap among all three repertoire indices *within each sample*. Pearson's correlations indicated that all three repertoire indices were highly correlated ($rs = 0.74–0.99$) in all samples, indicating a high level of empirical overlap. The same pattern of findings held across all repertoire index comparisons (Fig. 5). The degree of overlap within each sample was especially notable between the sum index and the diversity index, as they were consistently identical ($rs > 0.99$), indicating that they represent the same information in all samples.

Next, we tested the average association among all three repertoire indices *across all samples*. Results from internal meta-analyses suggest that all three repertoire indices were highly correlated across all samples, further indicating a high level of empirical overlap. The same pattern of findings held across all repertoire index comparisons (meta-analytic *r*s ranging from 0.79 to 0.99; Fig. 5). The degree of overlap across all samples was especially notable between the sum index and the diversity index, as they were consistently identical ($rs > 0.99$), indicating that they represent the same information across all samples.

Comparing the link between strategy repertoire and goal attainment across repertoire indices

Finally, we tested whether the magnitude of the correlations between strategy repertoire and goal attainment varied by repertoire index. Results suggest the magnitude of the association between strategy repertoire and subjective goal progress was larger for both the sum index and the diversity index compared to the distinct index. The magnitude of the associations between strategy repertoire and subjective goal progress were equivalent when comparing the sum index and the diversity index. Finally, there were no differences in the magnitude of the associations between strategy repertoire indices and domain-specific behavioral outcomes, such that

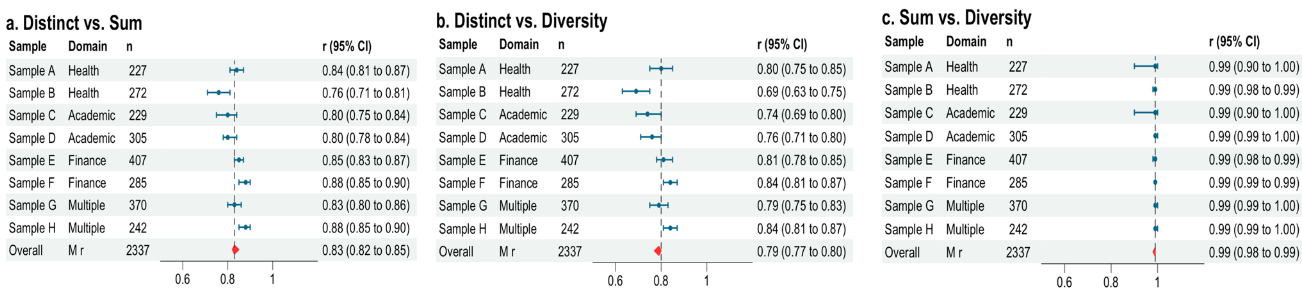


Fig. 5 Correlational and meta-analytic results among strategy repertoire indices for each sample. To easily compare the individual effect sizes compared to the average, the dashed line in each meta-analysis represents the overall meta-analytic effect

all three indices were similarly associated with healthy food consumption and adaptive financial behaviors (Table 3).

Discussion

People are highly motivated to change their behavior (Saad, 2023). From wanting to eat healthier, save money, perform well at school, or any range of personal goals they want to achieve, people need to have access to a range of tools to succeed. We propose that having a larger strategy repertoire (or strategy "toolbox") can help people achieve their goals. In the current research, we addressed several core unresolved research questions regarding the benefits of strategy repertoire (*how broadly does having larger strategy repertoire benefit different facets of goal attainment?*), their generalizability (*do the benefits of having a larger strategy repertoire apply across domains?*), and their measurement (*what is the best way to measure strategy repertoire?*).

Strategy repertoire broadly benefits different facets of goal attainment

The current research provides several types of evidence that highlight how the benefits of having a larger strategy repertoire can be relatively broad and generalizable. Our findings show that having a larger strategy repertoire may not just be beneficial when regulating stress and emotions, but also when trying to change different aspects of our behavior in the pursuit of important long-term goals. Specifically, we found that having a larger strategy repertoire was associated with greater goal attainment. This finding was particularly robust when considering subjective goal progress, with average meta-analytic associations ranging from large to very large in magnitude across several important life domains (health, academics, finance), self-set personal goals, as well as different operationalizations of strategy repertoire. However, findings were mixed regarding specific goal-related behaviors. Consistent with prior research (Bürgler et al., 2021; Southward et al., 2018; see also Smyth et al., 2023), we found that the associations between strategy repertoire and goal attainment varied not necessarily by domain, but by behavior. Specifically, having a larger strategy repertoire was associated with eating healthier and using adaptive financial behaviors that promote saving, but neither snack consumption nor subjective credit score.

On one hand, it is possible that having a larger strategy repertoire is only beneficial for certain outcomes and not others. Another possibility, however, is that what constitutes a "temptation" may be too subjective, and thus measures aiming to capture temptation-oriented behavior may have too much noise. For example, we opted to assess subjective credit scores based on previous research demonstrating a link between self-control and credit problems (Moffitt et al., 2011). However, a person's credit score reflects various factors such as the amount of debt a person has (e.g., including

Table 3 Results comparing the magnitude of the correlations between strategy repertoire and goal attainment progress across repertoire indices (Samples A–H)

Comparison	Predictor	Subjective progress				Healthy food				Financial behaviors			
		M r	*n*	*z*	*p*	*M r*	*n*	*z*	*p*	*M r*	*n*	*z*	*p*
1	Distinct	0.32	–	–	–	0.27	–	–	–	0.36	–	–	–
	Sum	0.39	2337	– 2.27	0.008	0.22	498	0.82	0.409	0.42	698	– 1.27	0.203
2	Distinct	0.32	–	–	–	0.27	–	–	–	0.36	–	–	–
	Diversity	0.38	2337	– 2.66	0.023	0.20	498	1.14	0.250	0.41	698	– 1.06	0.290
3	Sum	0.39	–	–	–	0.22	–	–	–	0.42	–	–	–
	Diversity	0.38	2337	0.39	0.698	0.20	498	0.33	0.744	0.41	698	0.22	0.829

For each comparison, the variable in common is the goal outcome student loan debt, which is not necessarily evidence of overconsumption), their bill-paying history, and new applications for credit products. Reports also suggest that a high percentage of people (around 40–50%) do not know their credit score (Anderson, 2019; Kilgore et al., 2020). Thus, there is likely too much noise for it to be a valid indicator of a person's ability to save money as we originally thought. This same concern can also apply to snack consumption. Although unhealthy snack consumption is commonly assessed in research on self-control (e.g., Adriaanse et al., 2014; De Ridder et al., 2012), the concept of "snacking" is neither inherently good nor bad (e.g., Miller et al., 2013) and may even be utilized in ways that promote goal attainment (e.g., Prinsen et al., 2019). Thus, like credit score, this measure may have too much noise to adequately capture a person's ability to make progress on their goal to eat healthy.

Strategy repertoire and its benefits generalize across domains

The current research also provides robust evidence that the benefits of strategy repertoire may generalize across domains. Most prior research examines strategies in individual domains (e.g., focusing on health, academics, *or* savings), with few studies systematically examining whether regulation differs across goals. Our findings show that the association between strategy repertoire and goal attainment was successfully replicated in all samples, within each domain, and for all indicators of goal attainment. Most importantly, we found no differences in the magnitude of the association between strategy repertoire and subjective goal progress across different domains.

We also tested the generalizability of strategy repertoire itself by examining within-person variation in strategy repertoire across domains. Among the people who reported multiple goals, their strategy repertoire was highly similar across their different goals. Specifically, we found relatively high intraclass correlations, suggesting that 71–82% of the variance in strategy repertoire was between-person (indicating a high degree of similarity across a person's strategy repertoire indices for each goal) and only 18–29% being within-person. Although this within-person variation is, at least in part, a product of measurement error (Wilms et al., 2020), it may also suggest that the convergence was not perfect and some slight differences emerged. One potential explanation is that these differences reflect the varying degree to which people naturally use different strategies in different domains. Despite these potential differences, findings were consistent across all levels of analysis—people were more likely to make greater progress on goals where they had a larger strategy repertoire *compared to their other goals*, and people who generally had a larger strategy repertoire across all goals were more likely to make greater progress on their goals compared to *other people*.

The idea that people may have a general strategy repertoire that is similarly beneficial across domains has important conceptual implications. At first glance, low within-person variability in strategy repertoire may appear at odds with recent theorizing that places greater emphasis on context-based regulation, or regulatory flexibility. After all, the idea here is that people should be able to flexibly use strategies based on context, which is at least partly demonstrated by *greater* within-person variability in strategy use across situations (Aldao et al., 2015; Blanke et al., 2019). However, having *low* within-person variability in a person's strategy toolbox across domains means that people are better able to adapt strategies across contexts. In other words, having a more general strategy toolbox that can be applied across domains should, in theory, make it easier to variably use strategies in daily life (Mischel & Mendoza-Denton, 2003; Tsukayama et al., 2012).

When measuring strategy repertoire, the number of strategies matters

As the field continues to move toward a more dynamic approach to regulation, it is also important to carefully consider the corresponding conceptual and methodological challenges. The current research addressed two of these challenges. First, there are substantial differences in how strategies are measured across published studies in the existing literature. One of the most challenging aspects of studying behavior change and self-regulation more broadly is the seemingly never-ending range of strategies people can use to achieve their goals. To address this challenge, we captured a person's strategy repertoire based on the recently validated Self-Control Strategy Scale since it measures a wide range of strategies that can be applied across domains (Katzir et al., 2021). Although the Self-Control Strategy Scale provides one solution for assessing the range of strategies within a person's repertoire, considering domain-specific strategy measures is also promising. For example, the Tempest Self-Regulation Questionnaire assesses strategies that promote healthier eating (De Vet et al., 2014), and the Regulation of Emotions Systems Survey (De France & Hollenstein, 2017) was designed to specifically capture one's emotion regulation strategy repertoire. Beyond survey measures, we could also develop a task where people indicate all the strategies they could use in hypothetical scenarios (e.g., Sheppes et al., 2011; Southward et al., 2018). Such an approach would minimize recall bias, capture strategy use beyond people's *beliefs* about what strategies they use, and more directly assess a person's strategy knowledge, all without being confounded by the number of regulation episodes experienced (e.g., Bürgler et al., 2021).

Second, there has also been substantial variation in how strategy repertoire is operationalized. To address this challenge, we compared three of the most common and/or recently developed repertoire indices and found that all of them performed the same. Although these findings provide robust support for the association between strategy repertoire and goal attainment, they also raise questions about how to operationalize strategy repertoire moving forward. The current findings suggest that assessing the extent to which people use different strategies provides little additional explanatory power and that simply measuring the number of strategies one has in their toolbox is minimally sufficient for capturing strategy repertoire. One possible explanation is that the sum and diversity indices are tapping into regulatory variability, which represents the general variation in strategy use across situations (Aldao et al., 2015). The underlying assumption of both indices is that variability is inherently adaptive (Bonnano et al., 2011; Wen et al., 2021), but this is not always the case (Aldao et al., 2015). For example, a person may frequently and haphazardly use many strategies across situations in the hopes that *anything* works. Although this "scattershot" approach represents high variability, it is likely to be ineffective and can even backfire (Aldao et al., 2015; Dixon-Gordon et al., 2015; Grommisch et al., 2020; Heiy & Cheavens, 2014). Consequently, this variability information may be getting "canceled" out in these indices, indicating that it may be beneficial to make a conceptual distinction between strategy repertoire (i.e., as a relatively stable individual difference) and how strategies are used (i.e., at the situational level).

Directions for future research

Although the current research was designed to provide strong foundational evidence of the association between strategy repertoire and goal attainment, several questions remain. First, we employed a recently validated measure that captures a wide range of strategies that people often use when trying to change their behavior. This approach helps us understand the implications of individual differences in people's *beliefs* about their strategy repertoire in helping them achieve their goals. Now that we have established a robust link between strategy repertoire and goal attainment across domains, future research would benefit from developing experiments or interventions aimed at teaching people a wide range of strategies to verify the causal implications of having a larger strategy repertoire in helping people achieve their goals. Such an approach is not only essential for verifying the causal implications of having a larger strategy repertoire in helping people achieve their goals but would also be ideal for ruling out possible alternative explanations (e.g., whether people believe they are making better progress on their goal simply because they have more strategies). With this in mind, our findings are particularly encouraging for research on multiple behavior change. For example, health behaviors are often interrelated (e.g., Noble et al., 2015) so there is a pressing need for interventions that simultaneously promote change in more than one health behavior (Prochaska et al., 2008). Based on the current investigation, one promising avenue is to help people build a well-equipped strategy toolbox that they can then adapt to different areas of their lives (e.g., exercise, eating habits, smoking).

Second, we found that the benefits of having a larger strategy repertoire did not necessarily vary by domain, but instead by behavior. Although assessing a range of domain-specific indicators of goal attainment is an important strength of the current research, future research would benefit from replicating these findings with additional objective behaviors—for example, academic test scores (e.g., Baldwin et al., 2022) or how much money people saved in a specified time (e.g., Riddell et al., 2023). Importantly, this is not to say that behavioral measures of goal attainment should be favored over measures of subjective goal progress, as they each offer unique insight into the goal pursuit process (Smyth et al., 2023). As noted previously, there are times when what is traditionally considered a "temptation" is not necessarily problematic. For example, perhaps there was a cause for celebration, and the person made sure to budget the "unhealthy" cake into their calories for the day. Despite the person endorsing the goal to eat healthy, eating the cake would not hinder their goal progress, which could be reflected by a higher score on subjective goal progress, even if behaviorally it might look like they "failed." Thus, to gain a more holistic understanding of the link between strategy repertoire and goal attainment, it would be beneficial for researchers to consider simultaneously measuring different facets of goal attainment that reflect both subjective goal progress and goal-specific behaviors.

Third, we focused on three domains where people commonly use regulatory strategies to change their behavior; however, the link between strategy repertoire and goal attainment may be different for other domains and/or goals. Although we have provided converging evidence showing that the benefits of strategy repertoire do not vary by domain, these results can be further bolstered by investigating the role of strategy repertoire in other domains of interest. One notable extension can be to climate change—not only is this a pressing global issue, but recent reports indicate that 80% of people around the world[1] are motivated to change at least some aspects of their behavior to help mitigate the effects of climate change (Pew Research Center, 2021), thus making it a prime candidate to test whether strategy repertoire can help people achieve their goals.

[1] This statistic represents the median across 17 countries. Individual countries range from 55 to 93%, with the U.S. and Canada being at 74 and 82%, respectively.

Finally, we primarily focused on the association between strategy repertoire and the more distal outcome of goal attainment. However, it is also important to consider more proximal regulation processes, such as the extent to which strategy repertoire influences how people choose and subsequently implement strategies in response to different situations they encounter in daily life. How people regulate within a particular situation largely (but not solely) depends on what tools they have available in their strategy toolbox. Future research can examine whether having a larger strategy repertoire is indeed associated with the ability to flexibly use strategies in daily life (Werner & Ford, 2023). For example, it would be interesting to further unpack the dynamics between strategy repertoire and situational factors, such as frequency in strategy use, perceived strategy effectiveness, or constraints (e.g., cognitive load, time) that may limit the availability of one's repertoire in a particular situation (e.g., Heiy & Cheavens, 2014). As another example, it may be the case that having a larger strategy repertoire provides people with the necessary tools to engage in polyregulation, or the use of multiple strategies in a single regulation episode (Ford et al., 2019; Werner & Ford, 2023). In this case, a person may attempt one strategy, but it does not work as well as intended so they choose a second back-up strategy. A person may also simultaneously "stack" two (or more) strategies, for example, in response to a particularly strong temptation. Future research would benefit from examining whether the size of a person's strategy repertoire is associated with the use of polyregulation in response to different regulation challenges.

Concluding comment

Having a larger strategy repertoire—or strategy "toolbox"—is a fundamental individual difference that has important implications for helping people achieve their goals. Although the present data preclude causal conclusions, we provide replicated evidence that the benefits of having a larger strategy repertoire may be wide-reaching, apply across several important domains, and are robust to different operationalizations of strategy repertoire. Importantly, by adopting a "toolbox" approach, we can start to have a better understanding of how strategies work together beyond the relative effectiveness of individual strategies. Such an approach is particularly important because having access to an array of "tools" plays a fundamental role in downstream regulation processes (e.g., providing the necessary tools to accommodate a wider range of situations in daily life), which sets the initial stage for successful regulation and ultimately promoting lasting behavior change.

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Declarations

Conflict of interest None.

References

Adriaanse, M. A., Kroese, F. M., Gillebaart, M., & De Ridder, D. T. (2014). Effortless inhibition: Habit mediates the relation between self-control and unhealthy snack consumption. *Frontiers in Psychology, 5*, 444.

Aldao, A., & Nolen-Hoeksema, S. (2013). One versus many: Capturing the use of multiple emotion regulation strategies in response to an emotion-eliciting stimulus. *Cognition & Emotion, 27*, 753–760. https://doi.org/10.1080/02699931.2012.739998

Aldao, A., Sheppes, G., & Gross, J. J. (2015). Emotion regulation flexibility. *Cognitive Therapy and Research, 39*, 263–278. https://doi.org/10.1007/s10608-014-9662-4

Anderson, J. (2019). *Survey: Nearly 40% of Americans don't know their credit score—do you?* https://www.gobankingrates.com/credit/credit-score/nearly-40-percent-americans-dont-know-credit-score/?utm_campaign=895055&utm_source=yahoo.com&utm_content=7

Baldwin, C. R., Haimovitz, K.,, Shankar, P., Gallop, R., Yeager, D., Gross, J. J., & Duckworth, A. L. (2022). Self-control and SAT outcomes: Evidence from two national field studies. *PLoS One, 17*(9), e0274380.

Blanke, E. S., Brose, A., Kalokerinos, E. K., Erbas, Y., Riediger, M., & Kuppens, P. (2019). Mix it to fix it: Emotion regulation variability in daily life. *Emotion*. https://doi.org/10.1037/emo0000566

Bonanno, G. A., & Burton, C. L. (2013). Regulatory flexibility: An individual differences perspective on coping and emotion regulation. *Perspectives on Psychological Science, 8*, 591–612. https://doi.org/10.1177/1745691613504116

Bonanno, G. A., Papa, A., Lalande, K., Westphal, M., & Coifman, K. (2004). The importance of being flexible: The ability to both enhance and suppress emotional expression predicts long-term adjustment. *Psychological Science, 15*, 482–487. https://doi.org/10.1111/j.0956-7976.2004.00705.x

Bonanno, G. A., Pat-Horenczyk, R., & Noll, J. (2011). Coping flexibility and trauma: The perceived ability to cope with trauma (PACT) scale. *Psychological Trauma: Theory, Research, Practice, and Policy, 3*, 117–129. https://doi.org/10.1037/a0020921

Bürgler, S., Hoyle, R. H., & Hennecke, M. (2021). Flexibility in using self-regulatory strategies to manage self-control conflicts: The

role of metacognitive knowledge, strategy repertoire, and feedback monitoring. *European Journal of Personality., 35*, 861.
Carpenter, T. P., & Law, K. C. (2021). Optimizing the scientific study of suicide with open and transparent research practices. *Suicide and Life-Threatening Behavior, 51*, 36–46. https://doi.org/10.1111/sltb.12665
Cheng, C., Lau, H.-P.B., & Chan, M.-P.S. (2014). Coping flexibility and psychological adjustment to stressful life changes: A meta-analytic review. *Psychological Bulletin, 140*, 1582–1607. https://doi.org/10.1037/a0037913
Collins, M. J., & O'Rourke, C. (2013). *Financial capability scale (FCS)*. University of Wisconsin Madison.
De France, K., & Hollenstein, T. (2017). Assessing emotion regulation repertoires: The regulation of emotion systems survey. *Personality and Individual Differences, 119*, 204–215. https://doi.org/10.1016/j.paid.2017.07.018
De Ridder, D. T., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviors. *Personality and Social Psychology Review, 16*(1), 76–99.
de Vet, E., de Ridder, D., Stok, M., Brunso, K., Baban, A., & Gaspar, T. (2014). Assessing self-regulation strategies: Development and validation of the tempest self-regulation questionnaire for eating (TESQ-E) in adolescents. *International Journal of Behavioral Nutrition and Physical Activity*. https://doi.org/10.1186/s12966-014-0106-z
Dixon-Gordon, K. L., Aldao, A., & De Los Reyes, A. (2015). Emotion regulation in context: Examining the spontaneous use of strategies across emotional intensity and type of emotion. *Personality and Individual Differences, 86*, 271–276. https://doi.org/10.1016/j.paid.2015.06.011
Duckworth, A. L., Taxer, J. L., Eskreis-Winkler, L., Galla, B. M., & Gross, J. J. (2019). Self-control and academic achievement. *Annual Review of Psychology, 70*(1), 373–399.
Ford, B. Q., Gross, J. J., & Gruber, J. (2019). Broadening our field of view: The role of emotion polyregulation. *Emotion Review, 11*, 197–208. https://doi.org/10.1177/1754073919850314
Fujita, K., Orvell, A., & Kross, E. (2020). Smarter, not harder: A toolbox approach to enhancing self-control. *Policy Insights from the Behavioral and Brain Sciences, 7*, 149–156. https://doi.org/10.1177/2372732220941242
Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science, 2*, 156–168. https://doi.org/10.1177/2515245919847202
Goh, J. X., Hall, J. A., & Rosenthal, R. (2016). Mini meta-analysis of your own studies: Some arguments on why and a primer on how: Mini meta-analysis. *Social and Personality Psychology Compass, 10*, 535–549. https://doi.org/10.1111/spc3.12267
Grommisch, G., Koval, P., Hinton, J. D. X., Gleeson, J., Hollenstein, T., Kuppens, P., & Lischetzke, T. (2020). Modeling individual differences in emotion regulation repertoire in daily life with multilevel latent profile analysis. *Emotion, 20*, 1462–1474. https://doi.org/10.1037/emo0000669
Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry, 26*, 1–26. https://doi.org/10.1080/1047840X.2014.940781
Gross, J. J., & Duckworth, A. L. (2021). Beyond willpower. *Behavioral and Brain Sciences*. https://doi.org/10.1017/S0140525X20000722
Heffer, T., & Willoughby, T. (2017). A count of coping strategies: A longitudinal study investigating an alternative method to understanding coping and adjustment. *PLoS ONE, 12*, e0186057. https://doi.org/10.1371/journal.pone.0186057
Heiy, J. E., & Cheavens, J. S. (2014). Back to basics: A naturalistic assessment of the experience and regulation of emotion. *Emotion, 14*, 878–891. https://doi.org/10.1037/a0037231
Hennecke, M., Czikmantori, T., & Brandstätter, V. (2019). Doing despite disliking: Self-regulatory strategies in everyday aversive activities. *European Journal of Personality*. https://doi.org/10.1002/per.2182
Inzlicht, M., Werner, K. M., Briskin, J. L., & Roberts, B. W. (2021). Integrating models of self-regulation. *Annual Review of Psychology, 72*, 319–345. https://doi.org/10.1146/annurev-psych-061020-105721
Kalokerinos, E. K., & Koval, P. (2024). Emotion regulation flexibility. In J. J. Gross & B. Q. Ford (Eds.), *Handbook of emotion regulation* (3rd ed.). The Guilford Press.
Kaplan, A. (1964). *The conduct of inquiry: Methodology for behavioral science* (1st ed.). Chandler Publishing Company.
Katzir, M., Baldwin, M., Werner, K. M., & Hofmann, W. (2021). Moving beyond inhibition: Capturing a broader scope of the self-control construct with the self-control strategy scale (SCSS). *Journal of Personality Assessment, 103*, 762–776. https://doi.org/10.1080/00223891.2021.1883627
Kilgore, A., Schwanhausser, M., & Benton, I. (2020). *Access to credit scores empowers consumers, strengthens the lending ecosystem*. Javlin Strategy & Research. https://www.transunion.com/content/dam/transunion/global/business/documents/tu-javelin-access-to-credit-scores-empowers-consumers-strengthens-lending-system-ig-2020.pdf
Knittle, K., Heino, M., Marques, M. M., Stenius, M., Beattie, M., Ehbrecht, F., Hagger, M. S., Hardeman, W., & Hankonen, N. (2020). The compendium of self-enactable techniques to change and self-manage motivation and behaviour vol 1.0. *Nature Human Behaviour, 4*, 215–223. https://doi.org/10.1038/s41562-019-0798-9
Koestner, R., Otis, N., Powers, T. A., Pelletier, L., & Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal progress. *Journal of Personality, 76*, 1201–1230. https://doi.org/10.1111/j.1467-6494.2008.00519.x
Kruglanski, A. W., Pierro, A., & Sheveland, A. (2011). How many roads lead to Rome? Equifinality set-size and commitment to goals and means. *European Journal of Social Psychology, 41*, 344–352. https://doi.org/10.1002/ejsp.780
Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. *Advances in experimental social psychology* (pp. 331–378). Elsevier.
Kung, F. Y. H., & Scholer, A. A. (2020). The pursuit of multiple goals. *Social and Personality Psychology Compass*. https://doi.org/10.1111/spc3.12509
Lee, I. A., & Preacher, K. J. (2013, September). Calculation for the test of the difference between two dependent correlations with one variable in common [Computer software]. Available from http://quantpsy.org
Litman, L., Robinson, J., & Abberbock, T. (2017). TurkPrime.com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods, 49*(2), 433–442. https://doi.org/10.3758/s13428-016-0727-z
Lougheed, J. P., & Hollenstein, T. (2012). A limited repertoire of emotion regulation strategies is associated with internalizing problems in adolescence: Adolescent emotion regulation patterns. *Social Development, 21*(4), 704–721. https://doi.org/10.1111/j.1467-9507.2012.00663.x
Miller, R., Benelam, B., Stanner, S. A., & Buttriss, J. L. (2013). Is snacking good or bad for health: An overview. *Nutrition Bulletin, 38*(3), 302–322.
Milyavskaya, M., Saunders, B., & Inzlicht, M. (2021). Self-control in daily life: Prevalence and effectiveness of diverse self-control strategies. *Journal of Personality, 89*, 634–651. https://doi.org/10.1111/jopy.12604

Milyavskaya, M., & Werner, K. M. (2018). Goal pursuit: Current state of affairs and directions for future research. *Canadian Psychology, 59*, 163–175. https://doi.org/10.1037/cap0000147
Mischel, W., & Mendoza-Denton, R. (2003). Harnessing willpower and socioemotional intelligence to enhance human agency and potential. In L. G. Aspinwall & U. M. Staudinger (Eds.), *A psychology of human strengths: Fundamental questions and future directions for a positive psychology* (pp. 245–256). American Psychological Association.
Mischel, W., Shoda, Y., & Rodriguez, M. (1989). Delay of gratification in children. *Science, 244*, 933–938. https://doi.org/10.1126/science.2658056
Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., Houts, R.,Poulton, R.,Roberts, B. W.,Ross, S.,Sears, M. R.,Thomson, W. M., & Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences, 108*(7), 2693–2698.
Muthén, L. K., & Muthén, B. O. (2017). Mplus: Statistical analysis with latent variables: User's guide (Version 8). Authors.
Noble, N., Paul, C., Turon, H., & Oldmeadow, C. (2015). Which modifiable health risk behaviours are related? A systematic review of the clustering of smoking, nutrition, alcohol and physical activity ('SNAP') health risk factors. *Preventive Medicine, 81*, 16–41. https://doi.org/10.1016/j.ypmed.2015.07.003
Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19*(1), 2. https://doi.org/10.2307/2136319
Peetz, J., & Davydenko, M. (2022). Financial self-regulation. *Social and Personality Psychology Compass*. https://doi.org/10.1111/spc3.12663
Pew Research Center. (2021). *In response to climate change, citizens in advanced economies are willing to alter how they live and work*. Pew Research Center. https://www.pewresearch.org/global/2021/09/14/in-response-to-climate-change-citizens-in-advanced-economies-are-willing-to-alter-how-they-live-and-work/
Prochaska, J. J., Spring, B., & Nigg, C. R. (2008). Multiple health behavior change research: An introduction and overview. *Preventive Medicine, 46*, 181–188. https://doi.org/10.1016/j.ypmed.2008.02.001
Riddell, H., Sedikides, C., Gucciardi, D. F., Sezer, B., Jackson, B., Thøgersen-Ntoumani, C., & Ntoumanis, N. (2023). Goal motives, mental contrasting with implementation intentions, and the self-regulation of saving goals: A longitudinal investigation. *Motivation Science, 10*(1), 28–39.
Saad, L. (2023). Seven in 10 Americans likely to set goals for 2023. *Gallup*. https://news.gallup.com/poll/467696/seven-americans-likely-set-goals-2023.aspx
Shannon, C. E. (1948). A mathematical theory of communication. *Bell System Technical Journal, 27*, 623–656. https://doi.org/10.1002/j.1538-7305.1948.tb00917.x
Sheppes, G., Scheibe, S., Suri, G., & Gross, J. J. (2011). Emotion-regulation choice. *Psychological Science, 22*, 1391–1396. https://doi.org/10.1177/0956797611418350
Smyth, A., Milyavskaya, M., Friese, M., Werner, K. M., Frech, M.-L., Loschelder, D. D., Anderson, J., Inzlicht, M., Kolbuszewska, M., & Wang, K. (2023). What constitutes successful goal pursuit? Exploring the relation between subjective and objective measures of goal progress. *Personality Science, 4*, 1–26. https://doi.org/10.5964/ps.12017
Soper, D.S. (2024). Significance of the difference between two correlations calculator [Software]. Available from https://www.danielsoper.com/statcalc
Southward, M. W., Altenburger, E. M., Moss, S. A., Cregg, D. R., & Cheavens, J. S. (2018). Flexible, yet firm: A model of healthy emotion regulation. *Journal of Social and Clinical Psychology, 37*, 231–251. https://doi.org/10.1521/jscp.2018.37.4.231
Tamir, M., Vishkin, A., & Gutentag, T. (2020). Emotion regulation is motivated. *Emotion, 20*(1), 115–119. https://doi.org/10.1037/emo0000635
Tsukayama, E., Duckworth, A. L., & Kim, B. (2012). Resisting everything except temptation: Evidence and an explanation for domain–specific impulsivity. *European Journal of Personality, 26*, 318–334. https://doi.org/10.1002/per.841
Wen, A., Quigley, L., Yoon, K. L., & Dobson, K. S. (2021). Emotion regulation diversity in current and remitted depression. *Clinical Psychological Science, 9*, 563–578. https://doi.org/10.1177/2167702620978616
Werner, K. M., & Ford, B. Q. (2023). Self-control: An integrative framework. *Social and Personality Psychology Compass, 17*, e12738. https://doi.org/10.1111/spc3.12738
Werner, K. M., Inzlicht, M., & Ford, B. Q. (2022). Whither inhibition? *Current Directions in Psychological Science, 31*, 333–339. https://doi.org/10.1177/09637214221095848
Werner, K. M., Milyavskaya, M., Foxen-Craft, E., & Koestner, R. (2016). Some goals just feel easier: Self-concordance leads to goal progress through subjective ease, not effort. *Personality and Individual Differences, 96*, 237–242. https://doi.org/10.1016/j.paid.2016.03.002
Werner, K. M., Milyavskaya, M., Klimo, R., & Levine, S. L. (2019). Examining the unique and combined effects of grit, trait self-control, and conscientiousness in predicting motivation for academic goals: A commonality analysis. *Journal of Research in Personality, 81*, 168–175. https://doi.org/10.1016/j.jrp.2019.06.003
Wilms, R., Lanwehr, R., & Kastenmüller, A. (2020). Do we overestimate the within-variability? The impact of measurement error on intraclass coefficient estimation. *Frontiers in Psychology, 11*, 825. https://doi.org/10.3389/fpsyg.2020.00825