Pragmatic prospection is linked with positive life and workplace outcomes

6 authors, including:

Austin D. Eubanks
University of Arkansas at Fayetteville
20 PUBLICATIONS **93** CITATIONS

Roy F. Baumeister
The University of Queensland
117 PUBLICATIONS **7,380** CITATIONS
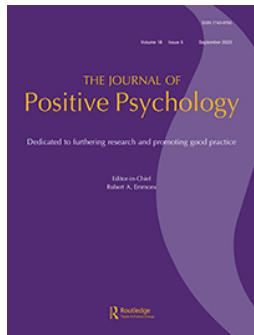
Pragmatic prospection is linked with positive life and workplace outcomes

Austin D. Eubanks, Andrew Reece, Alex Liebscher, Ayelet Meron Ruscio, Roy F. Baumeister & Martin Seligman

Published online: 29 Jun 2023.

Submit your article to this journal

View related articles

View Crossmark data

This article has been awarded the Centre for Open Science 'Open Data' badge.

This article has been awarded the Centre for Open Science 'Open Materials' badge.

Routledge
Taylor & Francis Group

Check for updates

Pragmatic prospection is linked with positive life and workplace outcomes

Austin D. Eubanks [ID][a], Andrew Reece [ID][a], Alex Liebscher[a], Ayelet Meron Ruscio[b], Roy F. Baumeister [ID][a] and Martin Seligman[a]

[a]BetterUp Labs, San Francisco, CA, USA; [b]Department of Psychology, University of Pennsylvania, Philadelphia, PA, USA

ABSTRACT

Pragmatic prospection is the ability to think deeply about the future in order to identify and to work productively toward goals. It involves imagining desirable future outcomes, setting sensible goals, making plans, and flexibly executing those plans. We conducted an exploratory survey of full-time working U.S. adults ($N = 1541$), measuring individual differences in pragmatic prospection along with life- and job-related outcomes. All data from the present survey are publicly available. Pragmatic prospection correlated positively with positive outcomes (e.g. life satisfaction, work productivity), correlated negatively with negative outcomes (e.g. anxiety, depression), and tracked with other adaptive personality traits associated with achievement and psychological adjustment (e.g. high conscientiousness, low neuroticism). These results point to pragmatic prospection as an important component of flourishing, both in the workplace and in daily life.

Introduction

Thinking about the future is a common human activity. In the West, about two out of every five thoughts focus on the future (Baumeister et al., 2020). In contrast, few animals can project more than minutes ahead, and in those cases the projection is mostly in the form of inflexible expectancies (Roberts, 2002; Suddendorf & Corballis, 2010). Humans' ability to conceptualize alternate possibilities in the imminent future is much more advanced than even humankind's closest ape relatives (Redshaw & Suddendorf, 2016). Having the capacity to think far ahead, and flexibly, has been argued to represent the key distinguishing feature of the human mind (Gilbert & Wilson, 2007; Redshaw & Suddendorf, 2016), prompting M. Seligman et al. (2016) to redub *homo sapiens* as *homo prospectus*. The present research was designed to explore correlates of a particular way of thinking about the future, and to test the hypothesis that this particular kind of thinking is generally adaptive, as would be reflected in its correlation with multiple and diversely favorable outcomes.

Prediction and pragmatic prospection

Planning, anticipating, and pondering possible future events is a central part of many human activities, including business, research, warfare, and love. Despite this, psychologists have studied thoughts about the past, such as in the rich literature on memory and reinforcement history, far more than thoughts about the future. When psychologists do study the future, one dominant theme has been the accuracy of prediction (Tetlock et al., 2014), including the prediction of one's future emotional states (Wilson & Gilbert, 2005).

Recently an alternative approach has emphasized *pragmatic prospection*, that is, thinking about the future in preparation for action. Whereas prediction is typically a matter of thinking about how events will turn out, pragmatic prospection involves anticipating choice points or crossroads at which events can go in different directions, so one can prepare for how to act and influence events. Baumeister et al. (2016) proposed that pragmatic prospection involves at least two distinct phases. The first phase involves thinking about what future outcomes or events one would like to happen. This phase is presumed to be characterized by pleasant, optimistic thoughts. The second phase involves thinking about how to reach the desired outcome or goal. The sobering recognition of potential pitfalls and obstacles shifts thinking away from optimism toward realism. Evidence for the two-phase model has been provided by Sjåstad and Baumeister (in press), who found that rapid, intuitive predictions about one's future tended to have a strong optimistic bias, whereas being required to wait at least 10–15 seconds before making predictions curtailed the optimistic bias.

Theorists have argued that pragmatic prospection is essential for goal achievement and that individuals who

engage in higher levels of pragmatic prospection should experience more success (Baumeister et al., 2016). Indeed, the basic links among goal setting, goal achievement, and satisfaction have been well supported for decades (e.g. Locke et al., 1970). Whether pragmatic prospection is, in fact, associated with positive outcomes remains to be tested. We explored this question using the Pragmatic Prospection Scale (Ruscio et al., 2023), a newly developed measure of individual differences in pragmatic prospection. Grounded in pragmatic prospection theory, this measure yields a total score as well as four subscale scores capturing dispositional tendencies to imagine future desired outcomes, set sensible goals, make plans, and execute plans in a flexible fashion.

The present research was largely exploratory. We hypothesized that a heightened tendency to engage in pragmatic prospection would be associated with a variety of mainly positive outcomes, but we had no strong basis for predicting which ones. In a large sample of U.S. adults who were employed full-time, we measured indicators of job-related success and satisfaction, such as salary, self-rated productivity, recent promotions, and recent frequency of thoughts about changing jobs. We also assessed several personality dimensions that have adaptive significance, such as Big Five traits, cognitive flexibility, and 'psychological capital' (the latter incorporating subdimensions of efficacy, hope, resilience, and optimism). To explore common mental health concerns, we measured anxiety and depression. We also assessed personal prospects by asking respondents whether they expected to reach most of their goals and how successful they expected to be in their daily lives. Last, we assessed overall life satisfaction. Briefly, we hoped to find evidence that people who engage in more pragmatic prospection would report better job outcomes, higher life satisfaction, more psychological capital, less anxiety and depression, and more positive personality traits (i.e. low neuroticism but high extraversion, agreeableness, openness, and conscientiousness).

Method

Participants and procedure

We used the Prolific (www.prolific.co) crowd-sourcing platform to recruit U.S. residents who were at least 18 years old and worked 40 hours or more per week. Respondents completed our online survey during the period of June 20–30, 2021. Of the 1,652 respondents who started the survey, 111 failed to complete the survey, yielding a final sample of 1,541 respondents (see Table 1). All respondents had a ≥ 90% Prolific approval rate and were paid $5.00 for their participation, with a median survey completion time of approximately 24 minutes. The survey was divided into two counterbalanced blocks of questions: one block contained all respondent demographics and job-related[1] measures, whereas the other block contained all other measures. We randomized all measures within each block, as well as all items within each measure. Three attention check items were inserted at random points in the survey to capture inattentive responding.

Measures

Demographics and job-related items

Respondents indicated their identified gender, age, primary race/ethnicity, highest completed education level, parental status, income (and whether they were in a salaried or non-salaried position), and an estimation of how much time they spent completing surveys on the day they completed our survey. With regard to their primary employment, respondents indicated their industry (e.g. education, financial services, health services, manufacturing), job function (e.g. sales, IT, engineering, operations), job title (open response), and a description of their responsibilities (e.g. tasks performed, team members interacted with, results generated; responses were required to be > 100 characters). Additionally, respondents reported how long they had been employed at their current job, whether their job was a management or individual contributor position (or both), whether they worked on a team (and if so, how many were on their team), how many employees they were responsible for, the size of the organization for which they worked, and how many compensation- or title-changing promotions they had received in the past year.

Our primary job-related outcomes were productivity and intent to leave. Respondents used Likert-type scales to report how productive they had been at work recently (0 = not at all productive; 10 = full productivity) and how often they had thought about leaving their work organization in the 30 days prior to completing the survey (1 = never; 5 = very often). Respondents also used separate 7-point Likert-type scales (1 = extremely unlikely; 7 = extremely likely) to rate the likelihood they would accomplish their goals and be successful *at work*.

Primary variables of interest

Pragmatic Prospection Scale. To measure individual differences in respondents' future-oriented thinking, we used Ruscio et al. (2023) 18-item Pragmatic Prospection Scale. The scale is based on Baumeister et al. (2016, 2018) conceptualization of pragmatic prospection and was designed to capture all theorized facets of the construct. Respondents use a 7-point Likert-type scale to indicate

Table 1. Demographic Characteristics of Respondents.

Characteristic	Total (N = 1,541)	Females (n = 649)	Males (n = 892)
Age			
18–24	123 (8.0%)	60 (9.2%)	63 (7.1%)
25–34	709 (46%)	283 (44%)	426 (48%)
35–44	412 (27%)	162 (25%)	250 (28%)
45–54	196 (13%)	94 (14%)	102 (11%)
55–64	90 (5.8%)	46 (7.1%)	44 (4.9%)
65+	11 (0.7%)	4 (0.6%)	7 (0.8%)
Race/ethnicity			
African-American	162 (11%)	58 (8.9%)	104 (12%)
Asian-American	123 (8.0%)	50 (7.7%)	73 (8.2%)
Caucasian	1,161 (75%)	503 (78%)	658 (74%)
Hispanic/Latino	65 (4.2%)	23 (3.5%)	42 (4.7%)
Other	30 (1.9%)	15 (2.3%)	15 (1.7%)
Education			
< Bachelor's degree	364 (24%)	149 (23%)	215 (24%)
Bachelor's degree	613 (40%)	280 (43%)	333 (37%)
Master's degree	402 (26%)	151 (23%)	251 (28%)
Advanced degree (e.g. PhD, JD, MD)	162 (11%)	69 (11%)	93 (10%)
Is a parent (yes):	664 (43%)	233 (36%)	431 (48%)
Income (USD)			
<20K	131 (8.5%)	76 (12%)	55 (6.2%)
<35K	149 (9.7%)	72 (11%)	77 (8.6%)
<50K	224 (15%)	109 (17%)	115 (13%)
<75K	437 (28%)	196 (30%)	241 (27%)
<100K	299 (19%)	109 (17%)	190 (21%)
100K+	301 (20%)	87 (13%)	214 (24%)
Daily survey time			
<1 hour	1,115 (72%)	502 (77%)	613 (69%)
1–2 hours	312 (20%)	106 (16%)	206 (23%)
2–3 hours	75 (4.9%)	28 (4.3%)	47 (5.3%)
3–4 hours	22 (1.4%)	6 (0.9%)	16 (1.8%)
≥4 hours	17 (1.0%)	7 (1.1%)	10 (1.0%)

Note. Data are displayed as *n* (within column %). Income and age are bucketed in this table for summary, but continuous values are available in the data. Daily survey time refers to how much time respondents had spent completing other surveys prior to our survey on the day of the study.

how true each item is of them (1 = very untrue; 7 = very true). Factor analyses in large samples of American working adults and undergraduate students have identified a consistent set of four factors, all of which load on an overall factor. Consequently, responses are averaged to form an overall scale score of *Pragmatic Prospection* (α = .87 in the present sample) as well as four subscale scores comprising four to five items each: *Imagining Outcomes* (α = .80; 'I contemplate my ideal outcomes for the future'), *Setting Sensible Goals* (α = .84; 'My goals exceed the reality of what I can do' [reverse scored]), *Making a Plan* (α = .81; 'I make plans that specify different courses of action depending on how things progress'), and *Flexible Execution* (α = .84; 'I am unsure what to do when things don't go as planned' [(reverse scored]). The full scale, including all items, scoring instructions, and information regarding reliability and validity, can be accessed on the scale website (https://web.sas.upenn.edu/ruscio-lab/measures/pragmatic-prospection-scale/).

Well-being. Mental health concerns, operationalized as anxiety and depression, were measured with the 4-item Patient Health Questionnaire (PHQ-4; Kroenke

et al., 2009). The PHQ-4 used a 4-point Likert-type scale (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day) to assess the extent to which respondents had been bothered by anxiety ('feeling nervous, anxious or on edge' and 'not being able to stop worrying or control worrying') and/or depression ('little interest or pleasure in doing things', and 'feeling down, depressed, or hopeless') over the preceding two weeks. Responses were summed into separate anxiety (α = .86) and depression (α = .84) subscales as well as an overall score (α = .89).

Life satisfaction was measured with Diener et al. (1985) Satisfaction with Life Scale, a 5-item scale designed to measure global cognitive judgments of one's life satisfaction. Respondents indicated how much they agree or disagree with each item (e.g. 'I am satisfied with my life') using a 7-point Likert-type scale (1 = strongly disagree; 7 = strongly agree). Responses were summed to form an overall life satisfaction score (α = .91). Finally, respondents also used separate 7-point Likert-type scales (1 = extremely unlikely; 7 = extremely likely) to rate the likelihood that they would accomplish their goals and be successful *in their daily lives.*

Psychological correlates. We measured psychological capital, or one's positive psychological resources, using the PCQ-12, a shortened 12-item version of Luthans's et al. (2007) 24-item Psychological Capital Questionnaire (PCQ-24). The PHQ-12 has been validated in a number of studies and cultures (e.g. Avey et al., 2011; Luthans et al., 2008). Our version was tailored to business outcomes and used a 6-point Likert-type scale (1 = strongly disagree; 6 = strongly agree) to measure the extent to which respondents agreed with each item. The scale yielded an overall composite score of *Psychological Capital* (α = .90) as well as four subscales, each captured with two to four items: *Efficacy* (α = .84; 'I feel confident contributing to discussions about the organization's strategy'), *Hope* (α = .81; 'right now I see myself as being pretty successful at work'); *Resilience* (α = .63; 'I can be "on my own" so to speak, at work if I have to'); and *Optimism* (α = .73; 'I always look on the bright side of things regarding my job').

Furthermore, we measured respondents' ability to switch between different thoughts and actions with Martin and Rubin's (1995) Cognitive Flexibility Scale. Respondents used a 6-point Likert-type scale (1 = strongly disagree; 6 = strongly agree) to indicate their agreement with each item (e.g. 'I can find workable solutions to seemingly unsolvable problems'). The scale's 12 items were summed to form a total *Cognitive Flexibility* score (α = .84).

Big five personality traits. We measured respondents' personality with Soto and John's (2017) short-form version of the Big Five Inventory-2 (BFI-2-S). Respondents used a 5-point Likert-type scale (1 = disagree strongly; 5 = agree strongly) to rate 30 items, including five to seven items for each personality dimension: *Extraversion* (α = .76; 'is full of energy'), *Agreeableness* (α = .75; 'assumes the best about people'), *Conscientiousness* (α = .81; 'keeps things neat and tidy'), negative emotionality (i.e. *Neuroticism*; α = .86; 'is temperamental, gets emotional easily'), and open-mindedness (i.e. *Openness to Experience*; α = .77; 'is fascinated by art, music, or literature').

Additional measures. Several additional measures were collected during this study. As the focus of the present study was on evaluating whether pragmatic prospection is a positive trait, we restricted analyses to outcome variables that past research has clearly shown to be adaptive or maladaptive. A list of all excluded measures is available in the supplementary materials. Furthermore, the full dataset, data dictionary, and scripts to reproduce our findings are publicly available at osf.io/6huqr/ for researchers who wish to probe specific interests or consider variables not discussed herein.

Attention checks. At three points throughout the survey, respondents were given attention check questions that gave them instructions to respond with a specific scale response (e.g. 'Please select *4 Agree* for this [question]'.).

Results

Analysis overview and strategy

Owing to the exploratory nature of our study, we had no strong, specific *a priori* hypotheses beyond suspecting that pragmatic prospection would be associated with mainly positive outcomes. Given the large sample size, even very small correlations were expected to be statistically significant, so we chose not to report *p*-values. To concentrate on associations that were potentially meaningful, we focused our interpretations on correlations larger than $r = .20$. Correlational analyses[2] were considered appropriate given the exploratory nature of our analyses and our goal of describing relationships between pragmatic prospection and a range of outcomes. Nevertheless, we have posted all our data for public use at osf.io/6huqr, consistent with open science practices, and we invite other researchers to conduct any further analyses they find useful or relevant.

Given that we measured a great many things that are intercorrelated, such that the amount of shared variance is nontrivial, it is fair to ask how much Pragmatic Prospection predicts outcomes after controlling for other variables. Thus, along with reporting the raw (focal) correlations[3] in Table 2, we report (in parentheses below each raw correlation) a partial correlation controlling for all Big Five personality dimensions as well as the demographic categories of gender, age, race, education, and income. Such controls offer a conservative test that presumably provides a lower boundary for the effects of pragmatic prospection. For example, if pragmatic prospection helps people earn higher salaries, then controlling for salary will erase some of the legitimate contributions of pragmatic prospection to positive outcomes. These controls will therefore underestimate any true relationship between, say, pragmatic prospection and happiness. In particular, the Big Five personality dimensions are 'Big' precisely because they are highly relevant to a very broad range of psychological phenomena (see Bainbridge et al., 2022), so controlling for them will likely erase some legitimate variance attributable to pragmatic prospection. Nevertheless, as our study was deliberately exploratory rather than strongly theory-driven, we sought to be conservative in identifying particularly promising leads for future research to pursue. These findings should be considered tentative first steps toward elucidating how different ways of thinking about the future contribute to human flourishing.

Table 2. Correlations with pragmatic prospection scale and subscales.

	PPS Subscales				
	Imagining Outcomes	Setting Sensible Goals	Making a Plan	Flexible Execution	PPS Total
Well-being					
PHQ - Anxiety	−0.04	−0.27	−0.12	−0.43	−0.32
	(0.09)	(−0.12)	(0.11)	(−0.10)	(−0.01)
PHQ - Depression	−0.13	−0.30	−0.16	−0.36	−0.34
	(0.01)	(−0.13)	(0.06)	(0.01)	(−0.03)
PHQ - Total	−0.09	−0.31	−0.15	−0.43	−0.36
	(0.06)	(−0.14)	(0.09)	(−0.05)	(−0.02)
Life satisfaction	0.13	0.21	0.19	0.28	0.29
	(0.02)	(0.07)	(0.05)	(−0.01)	(0.06)
Life goals	0.37	0.32	0.35	0.32	0.48
	(0.25)	(0.16)	(0.19)	(0.04)	(0.26)
Psychological correlates					
PsyCap - Efficacy	0.29	0.25	0.37	0.42	0.47
	(0.14)	(0.07)	(0.20)	(0.09)	(0.20)
PsyCap - Hope	0.39	0.30	0.41	0.40	0.53
	(0.23)	(0.09)	(0.22)	(0.08)	(0.25)
PsyCap - Resilience	0.37	0.29	0.34	0.37	0.48
	(0.22)	(0.10)	(0.17)	(0.08)	(0.23)
PsyCap - Optimism	0.33	0.25	0.33	0.34	0.44
	(0.18)	(0.05)	(0.16)	(−0.01)	(0.15)
PsyCap - Total	0.41	0.33	0.43	0.46	0.58
	(0.25)	(0.10)	(0.25)	(0.09)	(0.28)
Cognitive Flexibility	0.46	0.42	0.46	0.54	0.67
	(0.27)	(0.25)	(0.27)	(0.28)	(0.44)
Work-related					
Intent to leave	−0.05	−0.14	−0.12	−0.19	−0.18
	(0.04)	(−0.02)	(0.0)	(0.0)	(0.01)
Productivity	0.18	0.19	0.26	0.25	0.31
	(0.05)	(0.02)	(0.09)	(0.01)	(0.07)
Work goals	0.30	0.28	0.30	0.30	0.42
	(0.17)	(0.11)	(0.14)	(0.04)	(0.19)
Personality					
Extraversion	0.24	0.20	0.24	0.41	0.39
	(0.07)	(−0.01)	(0.02)	(0.14)	(0.09)
Agreeableness	0.28	0.23	0.24	0.29	0.37
	(0.13)	(0.03)	(0.04)	(0.0)	(0.08)
Conscientiousness	0.32	0.40	0.45	0.43	0.57
	(0.21)	(0.26)	(0.34)	(0.17)	(0.39)
Neuroticism	−0.19	−0.31	−0.29	−0.56	−0.49
	(−0.01)	(−0.15)	(−0.04)	(−0.36)	(−0.24)
Openness to experience	0.28	0.16	0.23	0.23	0.32
	(0.22)	(0.09)	(0.19)	(0.19)	(0.27)

Total *N* = 1,541. For each PPS subscale x measure row-pair, the raw correlations between the given subscale and measure are shown on the top row. The partial correlation (controlling for each of the Big Five traits, gender, age, race, education, and income) is displayed italicized and parenthetically below the raw correlation. Pairwise complete observations were used for handling missing data. However, across all variables, no more than 22 of the 1,541 cases were missing. Due to the large *N*, nearly all correlations are significant at $p < .05$; consequently, we do not report *p*-values. PPS = 'Pragmatic Prospection Scale'. PsyCap = 'Psychological Capital'. Life goals and work goals are the perceived probability of achieving goals and being successful in daily life and work, respectively.

Attention checks

Of the 1,541 participants, only 32 failed any of the attention checks, and only one person failed all three. This suggests that respondents were attentive overall and that the data were of good quality. Here we report the analyses on the full sample. We did, however, rerun all analyses excluding those 32 participants; the results were nearly identical, with correlations changing at most by .01 from the full-sample analyses.

Main findings: pragmatic prospection and flourishing

As expected, Pragmatic Prospection[4] was associated with many positive outcomes (see Table 2). Of the 95 raw correlations in Table 2, 79 were larger than .20, and just over half were larger than .30. Additionally, despite the high reliability of Pragmatic Prospection scores (α = .87), the intercorrelations of the four subscales (*r*s = .18–.49) suggested that they were, indeed, relatively distinct. These subtle distinctions manifested as somewhat variable patterns of associations with the outcomes included herein.

For psychological well-being, as shown in Table 2, Pragmatic Prospection was moderately negatively correlated with both depression and anxiety. Life satisfaction was moderately positively correlated with Pragmatic Prospection. Life satisfaction was also moderately negatively correlated with both anxiety and depression ($rs = -.40$ and $-.49$, respectively). Therefore, we controlled for depression and anxiety and found that the relationship between Pragmatic Prospection and life satisfaction remained significant, albeit weaker ($r_{partial} = .15$).[5] Respondents' perceptions of the probability that they would achieve their life goals were strongly positively correlated with Pragmatic Prospection, as were psychological capital and cognitive flexibility. Considering the subscales of Pragmatic Prospection, Flexible Execution and Setting Sensible Goals appeared more strongly correlated with mental health concerns and life satisfaction than did Imagining Outcomes and Making a Plan; however, all four subscales were moderately and robustly correlated with predicted life-goal achievement, cognitive flexibility, and all facets of psychological capital.

Regarding work-related outcomes, Pragmatic Prospection was moderately positively correlated with self-reported productivity and, to a modestly stronger degree, with the perceived probability of accomplishing goals and being successful at work (see Table 2). Intent to leave was negatively correlated with Pragmatic Prospection, though the association fell just below our .20 threshold. Notably, productivity and intent to leave were negatively correlated ($r = -.34$), consistent with the broader pattern that Pragmatic Prospection correlates positively with positive outcomes and negatively with negative outcomes.

Among Big Five traits, Table 2 shows Pragmatic Prospection was most strongly correlated with conscientiousness (positively) and neuroticism (negatively), although it also shared moderate, positive correlations with extraversion, agreeableness, and openness to experience. Consistent with prior research, anxiety and depression (reported jointly as PHQ-4 Total) were strongly correlated with neuroticism ($r = .69$) and moderately correlated with extraversion ($r = -.34$), agreeableness ($r = -28$), and conscientiousness ($r = -.36$). However, after controlling for anxiety and depression, Pragmatic Prospection was still moderately correlated with neuroticism ($r_{partial} = -.36$), extraversion ($r_{partial} = .30$), agreeableness ($r_{partial} = .30$), and openness to experience ($r_{partial} = .33$). Most associations with Big Five traits were robust across Pragmatic Prospection's subscales; only two of the 20 correlations fell below our .20 threshold (neuroticism with Imagining Outcomes; openness to experience with Setting Sensible Goals).

Distinctive associations with pragmatic prospection

Table 2 also reports the same relationships for Pragmatic Prospection (and its associated subscales) after controlling for the Big Five personality dimensions and the demographic variables of gender, age, race, education, and income (see the parenthetical correlations below the raw correlations). For correlations with each specific Big Five dimension, we partialed out the other four dimensions. We reiterate that this analysis strategy can be prone to erasing (or at least greatly reducing) legitimate relationships between pragmatic prospection and other constructs, but the findings are nevertheless of interest because they highlight effects that are distinctively about pragmatic prospection. Whereas 79 (out of 95) raw correlations surpassed the $r = .20$ threshold, this dropped to 24 when considering the partial correlations. Given the amount of information and statistical power that are lost by removing all of the variance associated with these potent variables, a case could be made for reducing the threshold to $r = .15$, which raises the tally of 'noteworthy' findings from 24 to 36. Notably, given the large sample size, most of the smaller correlations remained statistically significant.

We summarize briefly how things changed by moving from raw to partial correlations. Among the well-being measures, while most of the correlations with depression, anxiety, and satisfaction dropped below the .20 threshold, expecting to reach one's life goals survived our stringent controls. The link between pragmatic prospection and anticipated goal attainment is thus singularly potent, and it highlights the positive contribution of pragmatic prospection to human flourishing.

The Flexible Execution subscale yielded many of the largest raw correlations with well-being, but these were all vastly reduced in the partial correlations. The various links of pragmatic prospection to psychological capital also weakened substantially, except that associations with the Imagining Outcomes subscale – and with the full Pragmatic Prospection scale – remained fairly robust. The strongest survivor among the psychological correlates was cognitive flexibility, whose associations with the full Pragmatic Prospection scale and all of its subscales remained above the .20 threshold. By contrast, all work-related measures dropped below the threshold.

Correlations between the Big Five personality traits and the Pragmatic Prospection scales declined, often substantially, but the links to conscientiousness remained robust. A particularly strong survivor was the negative correlation between neuroticism and Flexible Execution – indeed, this was the largest of the partial correlations, even though those two variables saw dramatic reductions in their partial correlations with most other variables.

Discussion

We reiterate that our work was deliberately and explicitly exploratory and our findings are correlational. Conclusions should therefore remain tentative and should respect the causal ambiguity inherent in correlations. Our interpretations are largely post hoc speculations, though we did have some broad theoretical hypotheses and assumptions from the start. We begin by highlighting our main findings with brief speculations about possible implications. For these, we emphasize the raw correlations. Afterward, we discuss the implications of the partial correlations that controlled for all the variance in Big Five personality traits and demographic categories, which are illuminating despite undeniably throwing out some healthy statistical babies out with the bathwater. For example, we assume that thinking pragmatically about the future will enable people to have more successful careers and earn higher salaries – and so controlling for salary will erase from the data all of this possibly very real evidence of pragmatic prospection's beneficial impact.

Well-being and psychological outcomes

Overall, Pragmatic Prospection was moderately (negatively) correlated with anxiety and depression and (positively) with life satisfaction. These findings are consistent with the basically positive, adaptive value of thinking pragmatically about the future, as it is associated with better well-being overall. To be sure, the effects diminished in size (though they remained significant) when we controlled the well-being measures for each other, but that is probably less a sign of statistical weakness than of conceptual overlap. For example, controlling for depression reduces the face validity of life satisfaction measures: 'I'm really happy with my life, if we set aside how severely depressed I am!' Pragmatic prospection also correlated robustly with expecting to reach one's goals and achieve success in daily life.

At the subscale level, all four Pragmatic Prospection subscales were positively associated with life satisfaction. However, the weakest association was with Imagining Outcomes. This suggests that unhappy people can often imagine how things could be better, but may be less effective than happier people at setting goals, making plans, and flexibly executing those plans when things go wrong. Flexible Execution is the process that may be most impaired: This subscale had the strongest relationship with life satisfaction and (inversely) with anxiety and depression. The only other subscale that surpassed our $r > .20$ threshold was Setting Sensible Goals. Thus, high levels of anxiety and depression are accompanied by low perceived ability

to set realistic goals and to adjust efforts flexibly when things fail to go according to plan. It is worth acknowledging that the Flexible Execution and Setting Sensible Goals subscales are negatively worded (reverse scored) and ask about maladaptive behaviors, whereas the other subscales ask about adaptive behaviors. The negative tone of the items' wording may have contributed to stronger correlations with the negative states of anxiety and depression. Flexible Execution items also assess uncertainty over what to do when encountering unexpected problems or when faced with competing options on the way to a goal, so low scores may be capturing the low self-confidence, indecisiveness, and intolerance of uncertainty that are often found in anxiety and depression.

The measure of psychological capital used here combines efficacy, hope, resilience, and optimism. Not surprisingly, it shared consistent positive correlations with Pragmatic Prospection and each of its four subscales, with all 25 correlations being above our .20 threshold. The highest correlation was between the total scores for the two scales, reflecting the general pattern that people who hold positive beliefs about their capabilities and their likelihood of future success are also likely to be future-minded thinkers who imagine desired outcomes, set sensible goals, make plans, and execute those plans in a flexible fashion. The hope subscale showed the strongest correlations in general, but we note that the 'hope' name may be misleading. The items constituting the hope scale refer mainly to thinking about how to reach goals and perceiving success at work. The former obviously overlaps with pragmatic prospection (especially planning and flexible execution, which had the strongest correlations with hope), so it is likely that overlapping item content contributed to the high correlations with the so-called hope subscale.

The Cognitive Flexibility Scale also correlated moderately to strongly with Pragmatic Prospection and each of its subscales. Indeed, cognitive flexibility had the single highest correlation with Pragmatic Prospection. Although the title of this scale refers specifically to cognition, the items assess the ability to adjust one's actions and identify workable solutions when dealing with situations involving multiple possibilities. Consequently, the scale might most accurately be considered a measure of behavioral flexibility. Notably, the Pragmatic Prospection subscale that correlated most highly with cognitive flexibility was Flexible Execution. We take it as a good sign of validity that the two flexibility measures correlated so strongly.

Work-related outcomes

Two work outcomes that are of paramount importance to employers are worker productivity and intent to leave (i.e. quit the job). Productivity contributes to the firm's success,

while employee turnover is costly because of the disruption to existing relationships as well as the need to hire and train replacements. Self-rated productivity correlated moderately with Pragmatic Prospection and, to a slightly lesser extent, with its Making a Plan and Flexible Execution subscales. By contrast, although thinking about leaving for a new job seems almost by definition to be a form of pragmatic prospection, the correlations were all negative. The most plausible explanation for the negative correlations is that thoughts of changing jobs reflect frustration with one's current job rather than pragmatic preparation for seeking a better position. Unfortunately, we assessed only the frequency of thoughts about leaving one's job, without establishing whether those thoughts were constructive or led to concrete steps to improve the situation. Nonetheless, the view that our 'intent to leave' item captured job dissatisfaction rather than pragmatic steps toward a better job was supported by the substantial negative correlation between productivity and intent to leave. It is not the top performers who are thinking of leaving, but rather the workers who consider themselves relatively unproductive.

We note that these measures of productivity and intent to leave have limitations: Each included only a single item; self-rated productivity was subject to self-serving bias; and the item measuring intent to leave merely asked whether the respondent had thought about changing jobs during the past month, which is a long way from actual departure. These findings should therefore be considered tentative. Future research should evaluate the stability of pragmatic prospection across time. Perhaps investigating the ways and extent to which these behaviors are stable vs. modifiable could lead to insights into how to improve outcomes for individual workers and, in turn, companies. For example, if an individual consistently struggles with effective planning, perhaps facilitating the growth of that particular pragmatic prospection skill could causally increase productivity.

We additionally assessed the respondent's perception of the probability of achieving his or her work goals. The response to this question correlated robustly with Pragmatic Prospection and uniformly with all four of its subscales. A similar pattern, with even somewhat higher correlations, was found for the perceived probability of achieving life goals. By contrast, the correlations with actual (self-reported) productivity were somewhat weaker. One might well have expected the opposite, insofar as the future is by definition uncertain whereas productivity in the recent past is an objective fact. The finding that pragmatic prospection has a stronger relationship to anticipated future achievement than to past/present productivity may be due to the nature and measurement of pragmatic prospection as an inherently future-oriented construct.

Big five traits

In recent decades, personality research has been dominated by the Big Five, making it important to describe how these traits map onto individual differences in pragmatic prospection. We found that Pragmatic Prospection and its subscales were most strongly correlated with conscientiousness, with all relationships in the positive direction. Conscientiousness is heavily about self-control, and recent work has linked planning with both trait and state levels of self-control (Sjåstad & Baumeister, 2018). Also, conscientiousness and the narrower trait of self-control have been linked to a broad range of positive outcomes in work, social life, mental and physical health, and longevity (e.g. Moffitt et al., 2011; Shoda et al., 1990). The present results raise the possibility that thinking pragmatically about the future may be important to these benefits. The assumption that thinking about the future is adaptive and beneficial can be traced back to William James's (1890) influential assertion that thinking is for doing. Planning is obviously a central example of how thinking prepares for doing.

Neuroticism was the second strongest correlate of Pragmatic Prospection and its subscales, although the negative correlations varied in strength. The strongest correlation was with Flexible Execution. The items on that scale refer to getting stuck or being unsure what to do when unexpected difficulties arise on the way to a goal. Such difficulties can cause negative affect and confusion in anyone, but people high in neuroticism experience more negative affect and react more strongly to stress than others do, and consequently may be more strongly impeded. Depression and anxiety are strongly associated with neuroticism (e.g. Barlow et al., 2014) and can also contribute to getting stuck in the face of obstacles; it is therefore telling that the relationship between Pragmatic Prospection and neuroticism remained after controlling for anxiety and depression. At the other extreme, neuroticism was negatively, but rather weakly, correlated with Imagining Outcomes. Thus, while neuroticism seems to be only slightly related to an inhibited capacity to identify desired outcomes, it is more moderately related to inhibited capacities for setting sensible goals and making effective plans, and it is most strongly related to an inhibited capacity to implement plans in a flexible manner that is responsive to changing or unexpected circumstances.

Results for the other Big Five dimensions were also consistent with a view of pragmatic prospection as a positive, socially desirable trait. People scoring higher in pragmatic prospection tended to be more extraverted, more agreeable, and more open to experience than other people. Once again, controlling for anxiety

and depression only had a very modest effect on the association between Pragmatic Prospection and extraversion, agreeableness, and openness to experience.

Independent contributions of pragmatic prospection after controls

Even after conservative controls for Big Five personality traits and demographic variables, the full-scale Pragmatic Prospection score retained its link to confidence about reaching one's goals, both in life and in work. This may be one of the basic and adaptive functions of prospective thinking, namely to help people achieve their goals. The links with psychological capital also remained strong, perhaps unsurprisingly given the previously discussed overlap of this measure with the Pragmatic Prospection Scale. Finally, Pragmatic Prospection retained strong links with conscientiousness, neuroticism, and openness to experience.

Turning to the Pragmatic Prospection subscales, each retained a strong link to conscientiousness except Flexible Execution. By contrast, Flexible Execution retained a strong link to neuroticism, even while all the other subscales dropped well below our .20 threshold. These results further emphasize that people high in neuroticism find their greatest difficulty in carrying out their plans and reaching goals when unexpected problems arise. The other aspects of pragmatic prospection are more aligned with conscientiousness rather than neuroticism. As for openness to experience, its only subscale correlation that remained above .20 was with Imagining Outcomes. It is tempting to think that openness to experience thus has its influence in the earliest stages of human striving, in which the mind contemplates what future outcomes it wishes to have. However, we note that the .20 cutoff was somewhat arbitrary, and openness correlated at .19 with Making a Plan and with Flexible Execution, so openness to experience may be linked to later stages of striving as well.

Finally, cognitive flexibility was the only construct for which all Pragmatic Prospection subscale correlations remained above .20 after accounting for personality and demographic controls. For other psychological correlates, substantial correlations remained only for Imagining Outcomes and Making a Plan. Both of these subscales correlated with the psychological capital scale and its hope subscale. However, only Imagining Outcomes correlated with resilience, and only Making a Plan correlated with efficacy, at levels that met our .20 threshold. Imagining Outcomes was also the sole subscale that remained correlated with expected achievement of life goals after applying statistical controls, with all other subscale correlations dropping below .20.

Taken together, these results hint that cognitive flexibility and pragmatic prospection go hand in hand, and underscore the importance of future-focused visualization and planning for positive psychological outcomes.

Limitations and directions for future research

The current findings must be interpreted within the context of several important limitations. First, our study relied entirely on self-report. This made it possible to assemble a large dataset, but left open the question of whether individual differences in pragmatic prospection translate to tangible behavioral outcomes. A priority for future research is to include other methods and behavioral measures as well as external indicators of achievement, to complement the self-report measures included here. Second, in order to collect data on a wide range of constructs, we prioritized breadth over depth of assessment. Thus, some of our measures consisted of single items, and most constructs were assessed by a single measure. Future research would benefit from a more in-depth assessment of key constructs. In particular, a more thorough measure of 'intent to leave' (for a new job) would be desirable to untangle passive thoughts of dissatisfaction from concrete actions taken toward finding a better position. Third, all participants were U.S. adults who were employed full-time. Although the size of the sample was a significant strength, as was its diversity with respect to gender, race-ethnicity, and income level, the sample was fairly young and highly educated on average. There is a need to replicate these findings with individuals from non-Western cultures, particularly those that may have very different conceptions of time and meaningful achievement. Fourth, the current data were entirely observational and cross-sectional. It would be valuable to use experimental and longitudinal designs that are capable of testing whether pragmatic prospection predicts functioning and success in the long term. Finally, all the correlates of pragmatic prospection in this project pointed to desirable outcomes, but future work may profitably explore whether there are any downsides to pragmatic prospection.

Conclusions

Positive psychology has increasingly recognized the importance of future-focused cognitions to human flourishing (e.g. M. Seligman et al., 2016; M. E. P. Seligman et al., 2013). More recently, the importance of human agency has likewise emerged as a central concern. Pragmatic prospection theory combines these two strands by analyzing how people think about the future in preparation for action. Here, we used a recently

developed scale to measure individual differences in pragmatic prospection. We found that people who engage more frequently in pragmatic prospection enjoy a variety of benefits, including better mental health and life satisfaction. These forward-thinking individuals show an adaptive personality profile characterized in particular by higher conscientiousness and lower neuroticism. Their self-rated productivity is higher, and they report greater flexibility in adapting to and resolving problems. They benefit from advantages in various types of psychological capital, including efficacy, resilience, hope, and optimism. These findings provide further support for the validity of the Pragmatic Prospection Scale (Ruscio et al., 2023) by demonstrating associations with conceptually related measures of flexibility and planning. They also provide support for claims that prospection is an adaptive process that promotes success (Baumeister et al., 2016).

The many positive correlates identified here depict pragmatic prospection as an important mechanism of human flourishing. Looking ahead (pragmatically), we can anticipate that this orientation toward preparing for future actions will be a leading indicator of positive psychological outcomes.

Notes

1. One job-related question about perceived probability of success at work was included in the second block.
2. We note that one reviewer suggested re-analyzing with stepwise regression. However, we are swayed by the widespread sense that stepwise regression is a seriously flawed method that should generally be avoided (e.g. Harrell, 2001; Smith, 2018). Moreover, even if it does have some legitimate uses, the present research is not one of those, given that our study was exploratory rather than testing specific hypotheses about which variables are more influential (or ostensibly 'more important') than others.
3. For the full raw correlation table of all measures, see online supplementary materials at osf.io/6huqr/.
4. Henceforth, capitalized 'Pragmatic Prospection' refers specifically to the total score of the Pragmatic Prospection Scale, while 'Pragmatic Prospection' refers to the construct.
5. All partial correlations controlled for anxiety and depression jointly using the PHQ-4 Total measure.

ORCID

Austin D. Eubanks http://orcid.org/0000-0003-3497-5335
Andrew Reece http://orcid.org/0000-0002-8400-2235
Roy F. Baumeister http://orcid.org/0000-0003-1413-3296

Data Availability Statement

The data do not need to be requested from the author; they are freely avalible via the project Open Science Framework page, https://osf.io/6huqr/

Open scholarship

This article has earned the Center for Open Science badges for Open Data and Open Materials through Open Practices Disclosure. The data and materials are openly accessible at https://doi.org/10.1080/17439760.2023.2230479

References

Avey, J. B., Reichard, R. J., Luthans, F., & Mhatre, K. H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviours, and performance. *Human Resource Development Quarterly*, *22*(2), 127–152. https://doi.org/10.1002/hrdq.20070

Bainbridge, T. F., Ludke, S. G., & Smillie, L. D. (2022). Evaluating the Big Five as organizing framework for commonly used psychological trait scales. https://psyarxiv.com/vebtm, September 2022.

Barlow, D. H., Sauer-Zavala, S., Carl, J. R., Bullis, J. R., & Ellard, K. K. (2014). The nature, diagnosis, and treatment of neuroticism: Back to the future. *Clinical Psychological Science*, *2*(3), 344–365. https://doi.org/10.1177/2167702613505532

Baumeister, R. F., Hofmann, W., Summerville, A., Reiss, P. T., & Vohs, K. D. (2020). Everyday thoughts in time: Experience sampling studies of mental time travel. *Personality and Social Psychology Bulletin*, *46*(12), 1631–1648. https://doi.org/10.1177/0146167220908411

Baumeister, R. F., Maranges, H. M., & Sjåstad, H. (2018). Consciousness of the future as a matrix of maybe: Pragmatic prospection and the simulation of alternative possibilities. *Psychology of Consciousness: Theory, Research, & Practice*, *5*(3), 223–238. https://doi.org/10.1037/cns0000154

Baumeister, R. F., Vohs, K. D., & Oettingen, G. (2016). Pragmatic prospection: How and why people think about the future. *Review of General Psychology*, *20*(1), 3–16. https://doi.org/10.1037/gpr0000060

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Gilbert, D. T., & Wilson, T. D. (2007). Prospection: Experiencing the future. *Science: Advanced Materials and Devices*, *317*(5843), 1351–1354. https://doi.org/10.1126/science.1144161

Harrell, F. E. (2001). *Regression modeling strategies: With applications to linear models, logistic regression, and survival analysis* (Vol. 608). Springer New York. https://doi.org/10.1007/978-1-4757-3462-1

James, W. (1890). The perception of reality. *Principles of Psychology*, *2*, 283–324.

Kroenke, K., Spitzer, R. L., Williams, J. B., & Löwe, B. (2009). An ultra-brief screening scale for anxiety and depression: The PHQ–4. *Psychosomatics*, *50*(6), 613–621. https://doi.org/10.1016/S0033-31820970864-3

Locke, E. A., Cartledge, N., & Knerr, C. S. (1970). Studies of the relationship between satisfaction, goal-setting, and performance. *Organizational Behavior and Human Performance*, *5*(2), 135–158. https://doi.org/10.1016/0030-50737090011-5

Luthans, F., Norman, S. M., Avolio, B. J., & Avey, J. B. (2008). The mediating role of psychological capital in the supportive organizational climate—employee performance relationship. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, *29*(2), 219–238. https://onlinelibrary.wiley.com/doi/10.1002/job.507

Luthans, F., Youssef, C. M., & Avolio, B. J. (2007). *Psychological capital: Developing the human competitive edge* (Vol. 198). Oxford university press.

Martin, M. M., & Rubin, R. B. (1995). A new measure of cognitive flexibility. *Psychological Reports*, *76*(2), 623–626. https://doi.org/10.2466/pr0.1995.76.2.623

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. https://doi.org/10.1073/pnas.1010076108

Redshaw, J., & Suddendorf, T. (2016). Children's and apes' preparatory responses to two mutually exclusive possibilities. *Current Biology*, *26*(13), 1758–1762. https://doi.org/10.1016/j.cub.2016.04.062

Roberts, W. A. (2002). Are animals stuck in time? *Psychological Bulletin*, *128*(3), 473. https://doi.org/10.1037/0033-2909.128.3.473

Ruscio, A. M., Khazanov, G. K., Reece, A., & Kellerman, G. (2023). Development and validation of the pragmatic prospection scale, a measure of constructive future thinking. *Manuscript in Preparation*.

Seligman, M. E. P., Railton, P., Baumeister, R. F., & Sripada, C. (2013). Navigating into the future or driven by the past. *Perspectives on Psychological Science*, *8*(2), 119–141. https://doi.org/10.1177/174569161247317

Seligman, M., Railton, P., Baumeister, R., & Sripada, C. (2016). *Homo Prospectus*. Oxford University Press.

Shoda, Y., Mischel, W., & Peake, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. *Developmental Psychology*, *26*(6), 978. https://doi.org/10.1037/0012-1649.26.6.978

Sjåstad, H., & Baumeister, R. F. (2018). The future and the will: Planning requires self-control, and ego depletion leads to planning aversion. *Journal of Experimental Social Psychology*, *76*, 127–141. https://doi.org/10.1016/j.jesp.2018.01.005

Sjåstad, H., & Baumeister, R. F. (in press). Fast optimism, slow realism? Causal evidence for a two-step model of future thinking. *Cognition*. *PsyArxiv*. https://doi.org/10.31234/osf.io/v6ksu

Smith, G. (2018). Step away from stepwise. *Journal of Big Data*, *5*(1), 1–12. https://doi.org/10.1186/s40537-018-0143-6

Soto, C. J., & John, O. P. (2017). Short and extra-short forms of the big five inventory–2: The BFI-2-S and BFI-2-XS. *Journal of Research in Personality*, *68*, 69–81. https://doi.org/10.1016/j.jrp.2017.02.004

Suddendorf, T., & Corballis, M. C. (2010). Behavioural evidence for mental time travel in nonhuman animals. *Behavioural Brain Research*, *215*(2), 292–298. https://doi.org/10.1016/j.bbr.2009.11.044

Tetlock, P. E., Mellers, B., Rohrbaugh, N., & Chen, E. (2014). Forecasting tournaments: Tools for transparency and the quality of debate. *Current Directions in Psychological Science*, *23*(4), 290–295. https://doi.org/10.1177/0963721414534257

Wilson, T. D., & Gilbert, D. T. (2005). Affective forecasting. *Current Directions in Psychological Science*, *14*(3), 131. https://doi.org/10.1111/j.0963-7214.2005.00355.x