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A New Measure of Regulatory Focus:**Preventing Measurement Error by Promoting Best Validation Practices**

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Abstract

Objective: The goals of this project were to improve our understanding of chronic regulatory focus constructs and to provide researchers with a measure that adequately assesses the constructs, can distinguish individual differences effectively across the range of the constructs, and is appropriate for use in diverse populations.

Method: Employing best practices in construct validation, we developed the International Personality Item Pool Regulatory Focus Scale (IPIP-RFS). Utilizing 14 samples ($N = 4,867$), we established *substantive* (via expert ratings and regulatory focus literature), *structural* (via factor analysis, item response theory, and measurement invariance), and *external* (via convergent, discriminant, and predictive associations) validity.

Results: The IPIP-RFS adequately assesses the constructs of chronic promotion focus and prevention focus, can accurately assess individuals along the continua of the constructs, and is suitable for use among populations that vary in gender, race, and age. Individual differences in promotion focus reflect self-regulation and goal pursuit related to cognitive and behavioral exploration and flexibility (i.e., plasticity), whereas individual differences in prevention focus reflect self-regulation and goal pursuit related to motivational and interpersonal steadiness (i.e., stability).

Conclusions: Promotion and prevention focus are important elements of personality with broad implications for functioning and outcomes in health and other important domains.

Keywords: Regulatory Focus, Promotion Focus, Prevention Focus, Item Response Theory, Measurement Invariance

A New Measure of Regulatory Focus:

Preventing Measurement Error by Promoting Best Validation Practices

At its core, regulatory focus theory (Higgins, 1997) proposes that the hedonic principle of approaching pleasure and avoiding pain operates through two distinct self-regulatory foci: *promotion*—self-regulation in the service of accomplishment and aspiration—and *prevention*—self-regulation in the service of security and obligation. This theory has been quite influential in psychology and other disciplines. For example, a cursory search for *regulatory focus* in the PsycINFO database yielded over 1,700 records, and Higgins' (1997) seminal *American Psychologist* article “Beyond Pleasure and Pain” has been cited over 3,000 times according to PsycINFO and over 3,800 times according to Web of Science.

Despite the wide popularity and influence of the theory, questions remain regarding how to best understand and measure individual differences in regulatory focus and what exactly the regulatory focus construct is and is not (e.g., Summerville & Roese, 2008; Haws et al. 2010). In line with recent best practice recommendations regarding scale validation (e.g., Clark & Watson, 2019; Flake et al., 2017; Flake & Fried, 2020), the goals of this project were to develop a measure of chronic regulatory focus from the open-access International Personality Item Pool (IPIP; Goldberg et al., 2006) and to position regulatory focus in the broader constellation of personality. Utilizing 14 samples ($N = 4,867$; see Table 1), we aimed to improve understanding of regulatory focus constructs and to provide researchers with a useful measure that adequately assesses the constructs, can distinguish individual difference across the entire range of the constructs, and is appropriate for use among varied populations.

We divided this paper into three phases related to construct validation. In Phase 1 we describe initial scale development and item selection based on expert ratings, factor analysis, and

item response theory analysis. In Phase 2 we position the scale in relation to other measures of regulatory focus, personality more generally, and selected criterion variables. In Phase 3 we examine the scale's measurement invariance with respect to gender, age, and race/ethnicity. Before detailing these phases of scale construction, we begin with a brief introduction into regulatory focus theory and measurement.

Regulatory Focus Theory, Measurement, and Relation to Broader Personality

Higgins (1997, 2012) proposes that the basic motivations to approach pleasure and avoid pain function through two *distinct* motivational systems which regulate goal-oriented behavior. Promotion focus involves concerns for nurturance, advancement, and growth. Individuals high in promotion focus (or those in a promotion-focused state) eagerly pursue desired outcomes, performing well on tasks that involve seeking gains, benefits, and advancement. Prevention focus involves concerns for safety, duty fulfillment, and meeting obligations. Individuals high in prevention focus (or those in a prevention-focused state) tend to be vigilant in avoiding undesired outcomes, performing well on tasks that involve monitoring for costs and maintaining stability.

Dispositional or trait differences in regulatory focus have been conceptualized and operationalized in many ways (e.g., General Regulatory Focus Measure [GRFM], Lockwood et al., 2002; Regulatory Focus Questionnaire [RFQ], Higgins et al., 2001; Regulatory Focus Scale, Fellner et al., 2007; Self-guide Strength, Shah et al, 1998; Selves Questionnaire, Higgins et al., 1986). The most frequently used self-report measures of regulatory focus, the RFQ and GRFM, have each been cited over 900 times according to Web of Science. The RFQ assesses participants' subjective histories of success with promotion-focused self-regulation (e.g., "I feel like I have made progress toward being successful in my life." "Compared to most people, are you typically unable to get what you want out of life?") and prevention-focused self-regulation

(e.g., “How often did you obey rules and regulations that were established by your parents?” “Growing up, did you ever act in ways that your parents thought were objectionable?”). The RFQ was developed and validated with undergraduate samples using a pool of items that contained items describing experiences with parents as well as more general experiences. The resulting scales were identified via examination of item distributions, exploratory factor analysis, and reliability analysis. The prevention scale focuses mainly on relations with parents (four of five items), whereas none of the six promotion items focus on parental relations.

The GRFM focuses on achieving success/ideals (e.g., “In general, I am focused on achieving positive outcomes in my life.” “I often think about the person I would ideally like to be in the future.”) and preventing failures (e.g., “In general, I am focused on preventing negative events in my life.” “I am anxious that I will fall short of my responsibilities and obligations.”). The 18-item GRFM was also developed using undergraduate samples in the context of examining the effects of positive and negative role models on academic motivation. Instead of focusing on subjective histories of promotion and prevention related success, as the RFQ did, it was intended to capture chronic promotion- and prevention-related concerns and goals. Beyond subscale reliabilities and the correlation between the subscales, no details of item selection and scale construction were given. Four items (two of each focus) are specific to academics and several questions are related to emotions such as fear, worry, and anxiety.

In an examination of the RFQ and GRFM, Summerville and Roese (2008) suggested that these scales generally correspond to two different conceptual definitions of dispositional regulatory focus: self-guide and reference point. The self-guide definition posits that promotion focus is related to an *ideal* self-guide with a focus on achieving one’s aspirations, hopes, and dreams, whereas prevention focus is related to an *ought* self-guide with a focus on upholding

one's duties, responsibilities, and obligations. Operationally, the RFQ largely corresponds to this conceptual definition. The reference point definition of regulatory focus posits that promotion focus involves self-regulation that is focused on the presence or absence of benefits or gains (positive reference point), whereas prevention focus involves self-regulation that is focused on the absence or presence of costs or losses (negative reference point). Operationally, the GRFM largely corresponds to this conceptual definition. Summerville and Roese found that the promotion subscales were modestly related to one another (e.g., $r = .39$) and the prevention subscales were unrelated or inversely related (e.g., $r = -.15$). Higgins (1997) suggests that approach and avoidance tendencies and affectivity (i.e., positive and negative emotionality) should be (relatively) orthogonal to regulatory focus. Summerville and Roese found that the GRFM promotion scale demonstrated substantial overlap with behavioral activation (BAS; Carver & White, 1994) and positive affect (PA; Watson et al., 1988) and the GRFM prevention scale demonstrated substantial overlap with behavior inhibition (BIS) and negative affect (NA). Associations of BAS and PA with RFQ promotion and BIS and NA with RFQ prevention were either attenuated (in the case of promotion) or non-significant (in the case of prevention).

In the context of consumer behaviors and marketing, Haws et al. (2010) examined the interrelations among measures of regulatory focus as well as their predictive validity (e.g., preferences for jobs, reactions to advertisements, risky decision making, innovation). They included the RFQ, GRFM, the Selves Questionnaire, and Self-guide Strength. Demonstrating the conflation of constructs in the literature, BAS and BIS (i.e., markers of sensitivity to reward and punishment or approach and avoidance motivation) were included as additional indices of regulatory focus. Similar to findings from Summerville and Roese (2008), the regulatory focus scales showed relatively little relation to one another. The largest associations were GRFM

promotion with BAS and GRFM prevention with BIS. With respect to predictive validity, the measures showed differential relations with outcome variables, with the RFQ performing best.

Higgins et al. (2008) examined associations of promotion focus and prevention focus (using the RFQ) with the Big Five across six countries. Promotion focus was consistently positively related to extraversion, openness, and conscientiousness, negatively related to neuroticism, and sometimes positively related to agreeableness. Prevention focus was consistently positively related to conscientiousness, sometimes positively related to agreeableness, and sometimes negatively related to extraversion. RFQ promotion focus has also been found to be positively related to optimism (Grant & Higgins, 2003), openness to experience (Vaughn et al. 2008), self-esteem (Fulmer et al., 2010), and subjective well-being (life satisfaction, positive and negative affect; Ouyang et al., 2015). Both RFQ promotion and prevention were found to be positively related to trait self-control (Ouyang et al., 2015).

A meta-analysis of regulatory focus and work-related outcomes examined associations of regulatory focus (using the GRFM or similar measures) with broader dimensions of personality (Lanaj et al., 2012). Like associations reported above, promotion focus was positively related to extraversion, positive affectivity, BAS, conscientiousness, openness, agreeableness, and self-esteem, and it was negatively related to neuroticism. In contrast to the associations with RFQ prevention reported above, prevention focus was positively related to neuroticism, negative affectivity, and BIS.

As demonstrated by our brief review, research on regulatory focus suffers from lack of consistent content and statistical convergence across measures, mixed predictive validity, and inconsistent associations with broader personality. Further, the structural validity of these measures is unknown with respect to 1) accurately assessing people along the entire range of the

constructs and 2) measurement invariance across demographic groups. Based on best practice recommendations (e.g., Clark & Watson, 2019; Flake et al., 2017), we attempted to validate a new measure of regulatory focus and improve understanding of the regulatory focus construct as a whole.

Phase 1: Initial Scale Development and Item Selection

In an examination of a random sample of 39 empirical articles from the *Journal of Personality and Social Psychology*, Flake et al. (2017) concluded that most of the reported scales used to index latent constructs lacked evidence of construct validity. Recommendations were made to move beyond reliance on Cronbach's alpha to fully embrace techniques for each stage of construct validation: *substantive* (e.g., using expert ratings and existing literature to identify the scope of the construct), *structural* (e.g., factor analysis, item response analysis, measurement invariance), and *external* (e.g., convergent, discriminant, and predictive validity). In our initial phase, we used substantive (expert ratings) and structural (factor analysis and item response theory analysis) techniques to select regulatory focus items that reflect the latent constructs and can assess people all along the continua of the latent constructs.

Initial Regulatory Focus Item Identification in the International Personality Item Pool

We chose the IPIP (Goldberg et al., 2006) as a source for items because of its large and diverse pool of items (>2,500) and the opportunity to examine the data in the Eugene Springfield Community Sample (ESCS; Goldberg & Saucier, 2016). The ESCS participants have completed thousands of IPIP items and a wide range of scales, allowing researchers to evaluate links between many constructs (e.g., personality, attitudes, values, interests, everyday behaviors, mental and physical health). One hundred and forty-one items in the IPIP were initially identified by the first author as potentially representing either promotion focus or prevention focus,

attempting to be broadly inclusive of content related to various conceptions of regulatory focus. Three of the authors then indicated whether they thought each of the 141 items tapped promotion focus, prevention focus, both, or neither. These items were also sent to four external experts in regulatory focus theory each of whom had substantial experience in regulatory focus research (three experts have > 12 articles/chapters on the topic; one has 4 articles). The present authors have not had any professional collaboration with any of the experts. The experts were asked to indicate if an item reflected promotion focus, prevention focus, both, or neither, and to indicate the 10 best promotion items and 10 best prevention items (see supplemental materials for item details and instructions given to raters).

Consistency of ratings was high across the seven raters with respect to which items reflected promotion or prevention (using a two-way mixed model, prevention ICC = .89 and promotion ICC = .85). Potential items ($N = 53$) were included if four out of seven raters indicated they reflected prevention or promotion, with the exception that 2 promotion items that were indicated by only 3 of the raters were included to increase the number of reverse-coded items. Of the chosen items, there was a high correlation between the number of times experts identified an item as reflecting a specific focus and the number of times experts indicated that the item was one of the 10 best examples of that focus (promotion $r = .89$; prevention: $r = .85$). Notably, ratings mostly converged on items that were more conceptually congruent with the self-guide conceptualization of regulatory focus than the reference-point conceptualization, which is consistent with the observation that the reference-point conceptualization is redundant with more widely studied constructs of reward and punishment sensitivity and does not correspond well to the original theory of regulatory focus (Higgins, 1997).

Exploratory Factor Analysis of Initial Items

To begin the structural validation process, we collected data using Mechanical Turk ($N = 505$; Fuglestad et al., 2014) and examined the items in the Eugene Springfield Community Sample (ESCS; $N = 480$; Goldberg & Saucier, 2016). Participant details for all samples can be found in Table 1. Participants indicated the extent to which each item was descriptive of them using a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Exploratory factor analysis of the 53 items in each sample suggested two large factors (eigenvalues > 4) reflecting promotion focus and prevention focus. Table 2 shows the two-factor solutions with the highest loading 15 promotion and 15 prevention items across the two samples. Full exploratory factor analysis with all items can be found in the supplementary materials.

Table 1*Sample Characteristics*

Project	N	Collection Year(s)	Sample Population	Age (Mean, SD)	Gender (Female)	Race/Ethnicity			
						White	Asian	Black	Latinx/Hispanic ^a
1. Fuglestad et al. (2014)*	505	2011	MTurk	31.64 (11.6)	61%	74%	10%	4%	3%
2. Goldberg & Saucier (2016)**	480	1990s	Community	52.51 (12.63)	58%	98%	0%	0%	0%
3. Fu et al. (2017)	643	2019	Community	64.42 (5.81)	36%	88%	0%	5%	1%
4. Joyal-Desmarais et al. (2020)	568	2016	MTurk	39.74 (13.57)	56%	79%	7%	6%	6%
5. Fuglestad & Levert (2021)	506	2015	MTurk	33.78 (10.89)	66%	75%	5%	9%	6%
6. Phills & Fuglestad (2015)	405	2015	MTurk	36.29 (11.38)	54%	N/A	N/A	N/A	N/A
7. Lenne et al. (2023)	352	2016	Students	20.19 (2.94)	62%	60%	27%	5%	3%
8. Fuglestad (2018)	315	2015	MTurk	35.42 (11.95)	64%	72%	5%	11%	6%
9. Phills et al. (2016)	254	2015-16	MTurk	40.78 (13.56)	64%	79%	3%	8%	5%
10. Maki et al. (2016)	200	2012-13	Student	19.99 (2.48)	69%	54%	27%	2%	9%
11. Fuglestad & Arikawa (2019)	197	2015	Staff/Student	24.86 (9.03)	77%	64%	4%	9%	14%
12. Phills et al. (2016)	187	2016	Student	23.92 (7.21)	84%	66%	5%	8%	11%
13. Gallion & Fuglestad (2015)	171	2014	Student	22.4 (5.33)	88%	67%	5%	7%	8%
14. Fuglestad et al. (2023)	83	2012	Community	37.77 (12.36)	78%	81%	5%	4%	7%

Note. *Initial Scale development study; **Eugene Springfield Community Sample with full item set; ^aincludes those who identified as

White and Latinx/Hispanic

Table 2*Top Items Identified by Exploratory Factor Analysis*

	Mechanical Turk Sample (<i>N</i> = 505)		Eugene Springfield Sample (<i>N</i> = 480)	
	Promotion	Prevention	Promotion	Prevention
Just know that I will be a success	0.76		0.57	
Am excited by many different activities	0.64		0.56	-0.21
Come up with bold plans	0.62	-.20	0.51	
Remain hopeful despite challenges	0.65		0.46	
Feel up to any task	0.66		0.45	
Come up with new ways to do things	0.52		0.57	
Like to begin new things	0.59		0.49	
Look forward to the opportunity to learn and grow	0.49		0.58	
Take the initiative	0.63		0.42	
Eagerly look forward to things to come	0.57		0.47	
Will succeed with the goals I set for myself	0.56		0.48	0.20
Could be a success in many fields	0.55		0.47	
Cannot wait to get started on a project	0.53		0.48	
Can easily push myself forward	0.53	0.21	0.42	
Know that I can live my life in any way I want to	0.64		0.30	
Try to follow the rules		0.63		0.49
Do improper things (R)		0.54		0.53
Am careful to avoid making mistakes		0.61		0.45
Make careful choices		0.55		0.48
Disregard rules (R)		0.73		0.30
Pay attention to details		0.50	0.25	0.51
Usually take care of my responsibilities as soon as possible	0.22	0.59		0.40
Check over my work		0.52		0.47
Love order and regularity		0.57		0.42
Believe it is always better to be safe than sorry		0.55	-0.25	0.43
Neglect my duties (R)	0.24	0.55		0.42
Behave properly		0.55		0.42
Pay too little attention to details (R)		0.52		0.45
Take risks that could cause trouble for me (R)		0.58	-0.22	0.37
Take precautions		0.55		0.40

Note. FA utilized Principal Axis Factoring with Direct Oblimin rotation. Loadings with absolute value <

.2 are omitted.

Item Response Theory Analysis

Although factor analysis can be useful in identifying groups of items that reflect underlying latent variables, it does not ensure the items and scales are able to assess people accurately all along the entire range of the construct (Clark & Watson, 2019). Therefore, using the 53 items above, item response theory (IRT) analysis was used to identify highly discriminating items of varying difficulty (i.e., items that reliably distinguish people all along the promotion and prevention continua). The graded response model (GRM) was used in all IRT analyses below. To create relatively short, easy to use scales, the initial goal was to identify 10 promotion and 10 prevention items with at least four reverse-scored items for each focus. Full details of all IRT analysis, including scale information curves and item parameters and fit statistics, can be found in the supplementary materials.

In an initial step, two models were calibrated: (1) An unconstrained GRM and (2) a constrained GRM model. The difference between the unconstrained and constrained GRM is that the latter restricts all the discrimination parameters to be identical. All unidimensional calibration was done using the *ltm* package in R (Rizopoulos, 2006). A Bayesian Information Criterion (BIC; Schwarz, 1978) was used for model selection as it tends to prefer less complicated models than AIC (although see Kuha, 2004). The unconstrained GRM was a better fit (prevention: $df = 120$, BIC = 75454; promotion: $df = 145$, BIC = 92418) compared to the constrained GRM (prevention: $df = 97$, BIC = 75741; promotion: $df = 117$, BIC = 92900).

However, even though the unconstrained GRM fit the best, it did not necessarily fit well for any particular item. To check for item fit, the χ^2_* index derived by Stone (2000) was calculated. The χ^2_* values for each item were classified as follows: $\chi^2_* \geq 200$ was considered extremely misfitting; $200 > \chi^2_* \geq 100$ was considered moderately misfitting; $100 > \chi^2_* \geq 50$

was considered slightly misfitting; and $\chi^2 < 50$ was considered as fitting. Seven of the 53 items were severely misfitting, and all but one of those items were part of the promotion set. One reason for the high χ^2 statistics could be due to calibrating a multidimensional scale with a unidimensional method. Moreover, many of the discrimination parameters for both scales were rather small.

There was some degree of multidimensionality in both promotion and prevention items. For each focus, two potential sets of items were selected that loaded on the two largest, orthogonally rotated factors, which accounted for most of the total variance. The sets of potential items for each focus were assessed for multidimensionality and examined via the GRM. One set of promotion items and one set of prevention items reflected a balanced set of discrimination parameters (almost all > 1). Furthermore, the χ^2 values for each item were all below 100.

Next, using the procedures described above, the items were examined in the Mturk sample and the ESCS separately. Unfortunately, the best fitting items in one sample did not necessarily fit well in the other sample. Specifically, the best fitting items in the Mturk sample did not perform well in the ESCS data (e.g., seven of 10 discrimination values < 1.0 for each scale). However, the best fitting items in the ESCS performed well in the Mturk sample. Using these items in the combined sample, the prevention items performed well (two discrimination values < 1.0 ; both .91), as did the promotion items (two < 1.0 ; 0.89, and 0.93). The information curves were balanced across the traits, although both scales performed better at low rather than high levels of the traits. Unfortunately, the initial criterion to identify at least four reverse-scored items was not able to be met for promotion due to poorly fitting reverse-scored items.

After examining the list of 10 IRT identified items for each scale, a few modifications were made. Namely, for the prevention scale, the item “pay attention to details” was removed

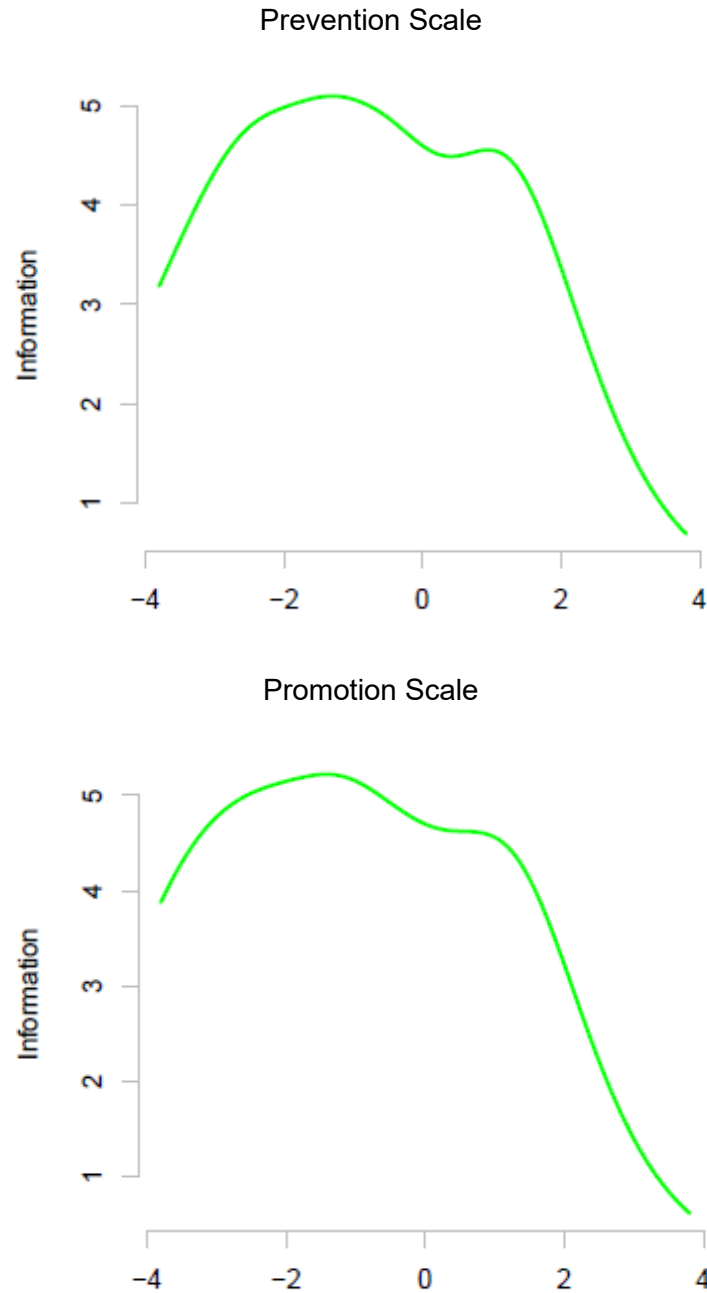
because it was essentially identical to “pay too little attention to details” (reverse scored). For the promotion scale, “could be a success in many fields” was removed because of a cross loading and “forgo opportunities” was removed because we judged it to be insufficiently clear. Potential replacement items were selected based on factor loadings and overall performance in subsequent GRM analysis of fit, discrimination, and information curves. “Am careful to avoid making mistakes” worked well as a new prevention item, and “Like to begin new things” and “Know that I can live my life in any way I want to” worked well as new promotion items. Finally, “plunge into tasks with all my heart” was removed for including a potentially confusing metaphor, and “quickly notice when something is wrong” was removed because of a relatively low primary loading and high cross loading. The final scales consisted of nine promotion and nine prevention items (see the Appendix for full scale and scoring instructions).

Discussion

In Phase 1 we utilized *substantive* and *structural* construct validation techniques to identify items from the IPIP that would represent the latent constructs of promotion focus and prevention focus. Specifically, ratings by three of the authors and four regulatory focus experts were used to identify potential promotion and prevention items from the large pool of IPIP items. After identifying 53 potential items, they were structurally examined in the ESCS and an Mturk sample. As noted above, prior regulatory focus measures have not established structural validity with respect to differentiation across the entire ranges of promotion and prevention foci. Using IRT, we were able to identify a set of nine promotion and nine prevention items that were highly discriminating and yielded information curves for both scales that were balanced across the ranges of the constructs (see Figure 1).

Figure 1

Information Curves for the Prevention and Promotion Scales



Note. Information curves were calibrated on the combined Eugene Springfield Community Sample and Mturk sample.

Phase 2: Convergent, Discriminant, and Predictive Validity

Mean scores of the nine promotion items and nine prevention items identified in Phase 1 were used in subsequent analyses to establish the *external* construct validity of the IPIP

Regulatory Focus Scale (IPIP-RFS). In Phase 2, we aimed to establish convergent and discriminant validity by examining associations with existing regulatory focus measures and broader personality. To establish predictive validity, we examined associations with relevant criterion variables of interest (e.g., health practices, everyday behaviors, relationship processes).

Examination of Regulatory Focus Measures

The initial Mturk sample completed the most widely used measures of regulatory focus: the RFQ (Higgins et al., 2001) and the GRFM (Lockwood et al., 2002). Several other samples ($N = 2666$) completed the IPIP-RFS and the RFQ. Table 3 shows the interrelations among the regulatory focus measures. In general, the three promotion scales showed convergence. The IPIP-RFS and RFQ prevention scales were moderately positively related, but the GRFM prevention scale was negatively related to all IPIP-RFS and RFQ scales. In the IPIP-RFS, promotion and prevention were more related relative to prior scales.

Table 3

Bivariate Correlations Among Regulatory Focus Measures

	IPIP Promotion	IPIP Prevention	RFQ Promotion	RFQ Prevention	GRFM Promotion	GRFM Prevention
IPIP Promotion	.81/.82	.41	.68	.10	-	-
IPIP Prevention	.49	.80/.78	.39	.42	-	-
RFQ Promotion	.69	.41	.68/.69	.15	-	-
RFQ Prevention	.16	.39	.28	.79/.81	-	-
GRFM Promotion	.65	.33	.47	.06	.86	-
GRFM Prevention	-.25	-.09	-.40	-.19	.11	.82

Note. Original Mturk sample is presented below the diagonal ($N = 505$). Samples 5-14 are presented above the diagonal ($N = 2666$). Cronbach's α is on the diagonal (MTurk on left; other samples on right). Correlations in bold indicate $p < .05$.

The initial Mturk Sample and the ESCS each completed assessments of BAS and BIS (Carver & White, 1994). As shown in Table 4, promotion focus was positively related to BAS

subscales and negatively related to BIS. The BAS subscales include reward (i.e., sensitivity to experiencing rewards), drive (i.e., motivations to pursue rewards), and fun seeking (i.e., pursuit of novelty and new experiences). The IPIP and RFQ prevention scales were negatively related to BAS fun-seeking and generally unrelated to BIS. The IPIP prevention scale was also positively related to BAS reward and drive subscales. Unlike the other prevention scales, the GRFM prevention scale was positively related to BIS. Partial correlations (controlling for each focus) of the bivariate associations reported in Tables 4 - 7 are available in the supplemental materials.

Table 4*Bivariate Correlations of Regulatory Focus with Behavioral Activation and Inhibition Systems*

	BAS Reward	BAS Drive	BAS Fun Seeking	BIS
IPIP Promotion	.45	.58	.35	-.23
IPIP Prevention	.39	.23	-.09	.10
RFQ Promotion	.33	.36	.12	-.28
RFQ Prevention	.09	-.05	-.19	.06
GRFM Promotion	.52	.50	.39	-.02
GRFM Prevention	.15	-.04	.06	.54
IPIP Promotion (ESCS)	.20	.33	.23	-.30
IPIP Prevention (ESCS)	.10	-.09	-.28	.03

Note. Second IPIP associations are from the Eugene Springfield Community Sample ($N = 480$).

All other associations are from the initial Mturk sample ($N = 505$). Correlations in bold indicate $p < .05$.

Positioning Regulatory Focus in the Context of Broader Personality

Many of our samples included measures of regulatory focus as well as the Big Five Aspects Scale (BFAS; DeYoung et al., 2007) and the Big Five Inventory (BFI; John et al., 2008). The GRFM was not included in subsequent data collections as it did not converge well with the current measure or the RFQ. Table 5 shows the bivariate relations of the IPIP-RFS and the RFQ with the Big Five, the Big Five aspects, and the metatraits plasticity (operationalized as the

average of extraversion and openness) and stability (operationalized as the average of conscientiousness, agreeableness, and neuroticism-reverse scored) (DeYoung, 2006).

Table 5

Bivariate Correlations of IPIP Regulatory Focus Scale and Regulatory Focus Questionnaire with Big Five Variables

	IPIP Promotion	IPIP Prevention	RFQ Promotion	RFQ Prevention
Big Five Aspects Scale (DeYoung et al., 2007)				
Plasticity	.60	.23	.56	.06
Extraversion	.61	.24	.55	.04
Enthusiasm	.51	.24	.48	.09
Assertiveness	.54	.17	.47	-.03
Openness	.35	.12	.36	.07
Intellect	.39	.18	.41	.11
Openness	.19	.03	.19	.01
Stability	.48	.65	.60	.37
Conscientiousness	.38	.71	.45	.32
Industrious	.46	.65	.54	.32
Orderliness	.20	.58	.25	.24
Agreeableness	.19	.45	.29	.24
Politeness	.07	.45	.18	.27
Compassion	.26	.32	.32	.15
Neuroticism	-.45	-.31	-.52	-.23
Volatility	-.30	-.28	-.39	-.24
Withdrawal	-.51	-.29	-.57	-.17
Big Five Inventory (John et al., 2008)				
Plasticity	.48	-.01	.41	-.13
Extraversion	.42	.01	.36	-.12
Openness	.32	-.03	.25	-.06
Stability	.36	.50	.45	.33
Conscientiousness	.32	.65	.44	.39
Agreeableness	.23	.34	.26	.26
Neuroticism	-.25	-.16	-.30	-.10

Note. IPIP-RFS with BFAS use samples 1, 2, 13, and 14 ($N = 1240$). IPIP-RFS with BFI use samples 2, 7, and 10 ($N = 975$). RFQ with BFAS use samples 1, 13, and 14 ($N = 753$). RFQ with BFI use samples 7 and 10 ($N = 552$). Correlations in bold indicate $p < .05$.

Both promotion scales were positively associated with extraversion, openness, conscientiousness, and agreeableness, and negatively associated with neuroticism. Both prevention scales were positively associated with conscientiousness and agreeableness, and negatively associated with neuroticism. The prevention focus associations were generally stronger with the IPIP measure relative to the RFQ. With respect to the metatraits, promotion focus was positively related to both plasticity and stability. IPIP promotion was more related to plasticity than stability; RFQ promotion was equally related to both metatraits. Both prevention scales were positively related to stability, although this association was stronger for IPIP prevention than RFQ prevention.

Predictive Validity

Health and Everyday Behaviors in the ESCS

Promotion and prevention focus have been shown to have a pervasive impact on people's behaviors and life outcomes, reflecting either an eager engagement with the world or a focus on safety and the fulfillment of obligations (Halvorson & Higgins, 2013). Therefore, we examined a wide range of criterion variables related to health practices and everyday behaviors in the ESCS (see Tables 6 and 7, respectively). Because prevention focus was strongly associated with conscientiousness, we also examined associations of prevention focus with these variables controlling for conscientiousness. A 39-item Health Practices Questionnaire assessed three health-related factors: risk avoidance (e.g., avoiding reckless traffic behavior, drinking, drug use), health monitoring (e.g., gathering health information; monitoring behaviors), and healthy

lifestyle (e.g., eating a balance diet and exercising). Participants indicated their agreement with each item using a 5-point Likert Scale (*strongly disagree* to *strongly agree*). A 49-item Eating Habits and Practices Inventory assessed three factors: avoidance of high calorie and high fat food consumption (e.g., burgers, bacon, donuts, chips); vegetable, fruit, and fiber consumption (e.g., whole grains, beans, vegetables); and calorie and fat trimming practices (e.g., no added fats and sauces). Twenty eating practice behaviors used the following response scale: *usually or always*, *often*, *sometimes*, *rarely or never*, and *not applicable*. Eighteen food frequency items used the following response scale: *never or less than once a month*, *1-3 times per month*, *1-2 times per week*, *3-4 times per week*, and *5 or more times per week*. Finally, eleven food frequency items used the following response scale: *never or less than once a week*, *about once a week*, *2 or 3 times a week*, *4 to 6 times a week*, and *about once a day or more* (see Goldberg & Strycker, 2002, for further analysis of these health-related items).

Table 6*Bivariate Correlations with Health Practices and Eating Behaviors*

	IPIP Promotion Focus	IPIP Prevention Focus
Risk Avoidance	-.11	.47
Health Monitoring	.08	.24
Healthy Lifestyle	.13	.25
Avoid High Calorie/Fat Foods	.05	.10
F & V; Whole Grains	.10	-.06
Calorie & Fat Trimming	.01	.23

Note. Correlations in bold indicate $p < .05$. $N = 435$ for Risk Avoidance, Health Monitoring, and Healthy Lifestyle. $N = 384$ for Avoid High Calorie, F&V, and Calorie & Fat Trimming.

Both promotion and prevention focus were positively related to the healthy lifestyle factor (e.g. eat a balanced diet, exercise to stay healthy). However, promotion was negatively related to the risk avoidance factor, whereas prevention was positively related (e.g., less reckless

driving, drinking). Prevention focus was also positively related to health monitoring (e.g., gather information on things that affect my health), avoiding high calorie/fat foods (e.g., burgers, donuts, French fries) and calorie and fat trimming practices (e.g., use low calorie substitutes, do not add butter or extra sauces). Controlling for conscientiousness, prevention was still related to risk avoidance ($r = .39$), health monitoring ($r = .11$), healthy lifestyle ($r = .17$), and calorie and fat trimming ($r = .14$).

Everyday behaviors were assessed with 400 activity descriptions (e.g., borrowed money, chewed gum, donated blood, had a hangover, made a list, played chess, read poetry, slept past noon, yelled at a stranger). Participants indicated how often they had engaged in the activity using a 5-point scale: *never in my life*, *not in the past year*, *once or twice in the past year*, *three or more times in the past year but not more than 15 times*, and *more than 15 times in the past year*. As shown in Table 7, all of the largest associations with promotion focus were positive, whereas almost all of the largest associations with prevention focus were negative. With respect to the 20 everyday behaviors most related to prevention, 17 of 20 behaviors were still related controlling for conscientiousness.

Table 7

Bivariate Correlations of Regulatory Focus with Everyday Behaviors

	IPIP Promotion	IPIP Prevention
Behaviors most relate to promotion focus		
Made a new friend	0.29	0.03
Consulted for help or advice by someone with a personal problem	0.27	-0.04
Finished a large project	0.26	0.04
Learned a new skill	0.26	-0.04
Gave a prepared talk or public recital (vocal, instrumental, etc.)	0.25	-0.02
Stayed in a hotel, motel, or resort	0.25	-0.05
Sang in a car or shower	0.24	0.08
Tried something completely new	0.24	-0.03

Went sightseeing	0.24	0.02
Participated in an exercise program	0.24	0.04
Discussed ways to make money	0.24	-0.03
Washed or polished a car	0.24	0.04
Laughed when no one else was doing so	0.24	-0.07
Ate Chinese, Japanese, Thai, or Korean food	0.24	-0.01
Took a trip	0.23	-0.04
Obtained stock market prices	0.23	-0.02
Took photographs	0.22	0.05
Complimented someone	0.22	0.05
Went on a trip by myself	0.22	-0.12
Planned a party	0.22	0.03
Behaviors most relate to prevention focus		
Drank alcohol or used other drugs to make myself feel better	0.03	-0.25
Drove or rode in a car without a seatbelt	-0.01	-0.24
Broke a promise	-0.04	-0.24
Swore around other people	0.06	-0.24
Had a hangover	0.04	-0.23
Smoked marijuana	0.05	-0.23
Drove a car after having a few alcoholic drinks	0.07	-0.23
Took a hard drug (for example, cocaine, LSD, or heroin)	0.06	-0.22
Arrived at an event more than an hour late	0.07	-0.22
Let work pile up until just before a deadline	-0.01	-0.22
Spent an hour at a time daydreaming	0.07	-0.21
Had an overdue fine for a movie rental or library book	0.12	-0.21
Discussed sexual matters with a male friend	0.17	-0.21
Became intoxicated	0.08	-0.20
Drank alcohol during working hours	0.07	-0.20
Littered	-0.02	-0.20
Picked up a hitch-hiker	0.10	-0.20
Told a dirty joke	0.19	-0.19
Balanced my checkbook	0.01	0.18
Gave money to a panhandler	0.03	-0.18

Note. The 20 most related behaviors with each focus are shown. Correlations in bold indicate $p <$

.05. $N = 458$.

Associations of Value Similarity with Relationship and Personal Well-being

Prior work suggests that attitude and value similarities are important for relationship development and satisfaction (e.g., Gaunt, 2006; Horwitz et al., 2023). Because prevention focus

is related to stability in motivational and interpersonal functioning (e.g., Brodner et al., 2007; Finkel et al., 2009; Fuglestad et al., 2008), we expected that perceived value similarities would be more impactful for those higher in prevention versus promotion focus. Sample 8 was used to examine 1) how perceptions of value agreement/similarity between romantic partners would have different implications for relationship quality and personal well-being based on regulatory focus and 2) associations of core values with regulatory focus. With respect to value importance, prevention focus is theoretically characterized by people attending to safety and social responsibilities, themes which bear resemblance to the basic values of conformity, tradition, security, and benevolence, and frequently conflict with the pursuit of hedonism and stimulation. In contrast, promotion focus is theoretically characterized by attending to personal growth and exploration, themes that map onto values such as self-direction, achievement, and stimulation.

Participants (203 women; 112 men; age $M = 35$) were all in romantic relationships (years in relationship $M = 8.4$). The IPIP-RFS and RFQ were both assessed in this study. Consistent with prior research (e.g., Higgins et al., 2001; Bohns et al., 2013) a difference score between promotion focus and prevention focus for each measure was computed to index predominant regulatory focus (IPIP-RFS: $M = .13$, $SD = .61$; RFQ: $M = .37$, $SD = .97$). Participants also completed the 58-item version of Schwartz Value Survey (Schwartz, 1994) to assess core values from the standpoint of self and one's romantic partner. To index perceived value similarity for each participant, correlations were computed between the self and partner ratings ($M = .38$, $SD = .33$). The 18-item Perceived Relationship Quality Components Inventory (Fletcher et al. 2000) was used to assess relationship quality ($M = 5.73$, $SD = 1.15$). Finally, the 5-item Satisfaction with Life Scale (Diener et al., 1985) was used to assess personal well-being ($M = 4.74$, $SD = 1.42$). Table 8 shows correlations between regulatory focus and study variables.

Table 8

Correlations of Regulatory Focus with Schwartz Core Values, Value Similarity, Relationship Quality, and Life Satisfaction

	IPIP Difference	IPIP Promotion	IPIP Prevention	RFQ Difference	RFQ Promotion	RFQ Prevention
Conformity	-.26	-.002	.27	-.05	-.01	.05
Tradition	-.22	-.12	.11	-.23	-.17	.14
Security	-.15	.004	.15	-.04	.01	.06
Benevolence	-.18	.15	.33	.10	.29	.10
Universalism	-.02	-.10	-.08	.03	.02	-.02
Self-direction	.12	.10	-.02	.18	.24	-.04
Achievement	.25	.21	-.04	.23	.19	-.12
Stimulation	.37	.03	-.35	.09	-.13	-.19
Hedonism	.16	-.001	-.17	.01	-.07	-.07
Power	.10	-.17	-.27	-.18	-.37	-.07
Value Similarity	-.08	.20	.29	.08	.32	.15
Relationship Quality	-.01	.24	.25	.08	.30	.13
Life Satisfaction	.30	.47	.18	.23	.35	.00

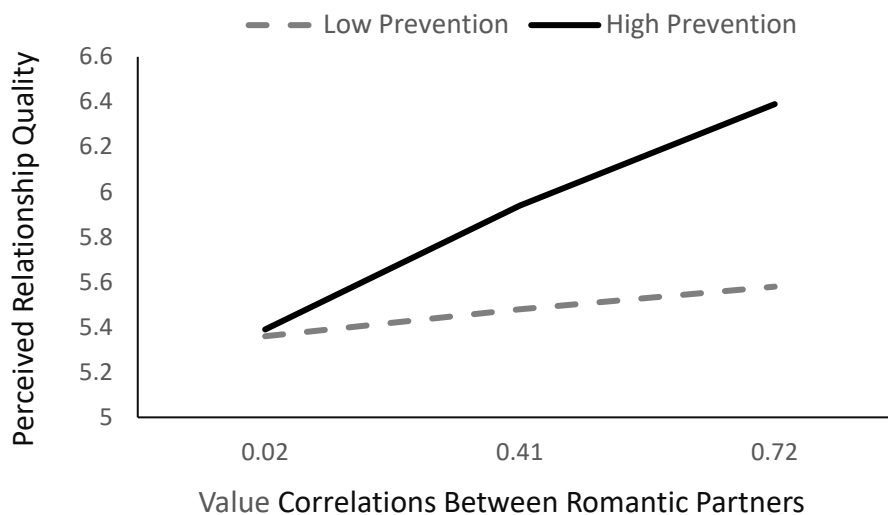
Note. Correlations in bold indicate $p < .05$. $N = 315$.

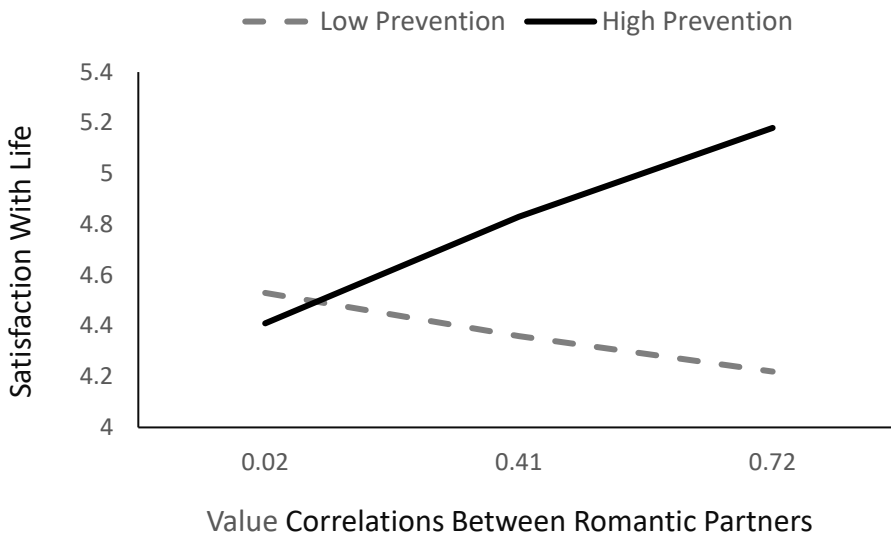
The process macro for SPSS was used to examine interactions between value similarity and regulatory focus in predicting relationship quality and life satisfaction. Analyses were initially performed using difference scores to index predominant chronic regulatory focus. Analyses were also performed using promotion and prevention focus separately. All analyses controlled for relationship length, gender, and age (full analysis is available on OSF). The IPIP difference score interacted with value similarity to predict life satisfaction ($\Delta R^2 = .03$, $p = .002$); the interaction term was similar in direction for predicting relationship quality but nonsignificant ($\Delta R^2 = .01$, $p = .08$). Conditional effects were examined at ± 1 *SD* of the moderating variables and were standardized using procedures specified by Bodner (2017). For more prevention-focused people, value similarity was positively related to life satisfaction ($b = .30$, $p < .001$) and relationship quality ($b = .39$, $p < .001$). For more promotion-focused people, value similarity was

not related to life satisfaction ($b = -.04, p = .58$), but was positively related to relationship quality ($b = .19, p = .02$). Looking at each focus separately, IPIP prevention interacted with value similarity to predict both relationship quality ($\Delta R^2 = .02, p = .01$) and life satisfaction ($\Delta R^2 = .03, p = .004$). As depicted in Figure 2, value similarity positively predicted relationship quality and life satisfaction for those higher in prevention ($b = .39, p < .001$; $b = .25, p = .003$), but not those lower in prevention ($b = .10, p = .21$; $b = -.08, p = .30$). IPIP promotion did not interact with value similarity in predicting relationship quality ($\Delta R^2 = .004, p = .23$) but did interact in predicting life satisfaction ($\Delta R^2 = .01, p = .04$; higher promotion: $b = .13, p = .06$; lower promotion: $b = -.08, p = .28$).

Figure 2

The Associations of Romantic Partner Value Similarity with Relationship Quality and Life Satisfaction by Prevention Focus





The RFQ difference score did not interact with value similarity to predict life satisfaction ($\Delta R^2 = .00, p = .94$) or relationship quality ($\Delta R^2 = .00, p = .99$). Looking at each focus separately, the interaction of value similarity and RFQ prevention was marginal in predicting both relationship quality ($\Delta R^2 = .01, p = .08$; higher prevention: $b = .39, p < .001$; lower prevention: $b = .16, p = .05$) and life satisfaction ($\Delta R^2 = .01, p = .06$; higher prevention: $b = .24, p = .008$; lower prevention: $b = -.005, p = .95$). RFQ promotion interacted with value similarity to predict both relationship quality ($\Delta R^2 = .02, p = .005$) and life satisfaction ($\Delta R^2 = .03, p = .003$). Value similarity positively predicted relationship quality and life satisfaction for those higher in promotion ($b = .37, p < .001$; $b = .18, p = .02$), but not those lower in promotion ($b = .07, p = .37$; $b = -.13, p = .08$).

Discussion

In Phase 2 we examined the convergent, discriminant, and predictive validity of the new promotion and prevention scales using several samples and thousands of participants. The IPIP promotion scale converged with the RFQ and GRFM promotion scales. The IPIP prevention scale showed some convergence with the RFQ prevention scale, but not the GRFM prevention

scale, which was also negatively related to RFQ prevention. Relative to the RFQ prevention scale, the IPIP prevention scale was more related to promotion scales, suggesting greater shared variance in the IPIP scales (not surprising because both foci involve goal-directed behaviors and effective self-regulation). With respect to behavioral activation and inhibition systems, promotion scales were positively related to BAS subscales (especially the drive subscale) and negatively related to BIS, suggesting that promotion-focused regulation involves the pursuit of rewards and benefits. IPIP prevention was negatively related to the fun seeking subscale (RFQ was as well) but positively related to reward and drive, suggesting that prevention-focused regulation involves some sensitivity to rewards, but also suppression of impulsivity and thrill seeking. Diverging from the IPIP and RFQ, the GRFM prevention scale was positively related to BIS, confirming that this scale is substantively different from both the new measure and the RFQ.

With respect to broader personality, promotion focus reflects self-regulation that is based in behavioral and cognitive flexibility and exploration as evidenced by strong associations with the metatrait plasticity and many of its constituent lower-level traits. On the other hand, prevention focus reflects self-regulation that is based in goal-related and interpersonal steadiness as evidenced by strong association with the metatrait stability, and an especially strong association with Conscientiousness. Examining aspects of the Big Five, promotion focus involves enthusiasm, assertiveness, industriousness, intellect, and lower withdrawal. Prevention focus involves orderliness, industriousness, and politeness. In general, these associations were clearer with the IPIP scales versus the RFQ. Particularly, the IPIP prevention focus scale showed effects in the same direction, but stronger in magnitude, for 21 of the 24 personality outcomes examined (Table 5). For promotion, the patterns were more similar, though the IPIP-RFS was

more aligned with extraversion and openness, whereas the RFQ was more aligned with agreeableness, conscientiousness, and neuroticism.

Consistent with expectations about predictive validity, the new IPIP promotion and prevention scales were differentially related to health behaviors and practices. Although promotion focus was somewhat positively related to lifestyle practices such as eating a balanced diet, it was negatively related to health behaviors involving risk avoidance. In contrast, prevention focus was positively related to risk avoidance, health monitoring, and healthy lifestyle practices. Everyday behaviors also showed distinct patterns of association—positive with promotion focus and negative with prevention focus. Further, the promotion-related behaviors reflect an eager engagement with the world, as well as cognitive and behavioral flexibility. The prevention-related behaviors reflect a focus on safety, security, and the fulfillment of duties and obligations.

Further demonstrating predictive validity, IPIP prevention focus was a consistent moderator of the associations between perceptions of value similarity with one's romantic partner and ratings of relationship quality and life satisfaction. Specifically, to the extent that one was higher versus lower in prevention focus, or predominantly more prevention focused versus promotion focused (indexed by a difference score), value similarity was more positively related to relationship quality and life satisfaction. A different pattern emerged using the RFQ. Neither predominant regulatory focus (indexed by a difference score) nor prevention focus consistently moderated associations of value similarity with relationship quality and life satisfaction (although the pattern for RFQ prevention was similar to IPIP prevention). However, RFQ promotion focus did act as a moderator. To the extent that one was higher versus lower in

promotion focus, value similarity was more positively related to relationship quality and life satisfaction.

Expectations regarding associations of regulatory focus with the importance of core values were more supported by the IPIP-RFS than the RFQ. Specifically, using a difference score for IPIP promotion and prevention, those more predominantly prevention-focused were more likely to endorse conformity, tradition, security, and benevolence as life-guiding values, whereas those more predominantly promotion-focused were more likely to endorse self-direction, achievement, stimulation, and hedonism. Similar patterns emerged for the RFQ with respect to tradition, self-direction, and achievement. Looking at specific foci, IPIP and RFQ promotion showed relatively similar associations with core values. IPIP prevention and RFQ prevention differed somewhat, with IPIP prevention tending to show stronger associations.

Having established initial *substantive* and *structural* validity in Phase 1 and *external* validity in Phase 2, we next examined the performance of our measure in varied samples to establish that the constructs have equivalent meaning across demographic groups and that accurate comparisons can be made using the new measure.

Phase 3: Confirmatory Factor Analysis and Measurement Invariance Analysis

The IPIP-RFS was measured in 12 additional samples, beyond those used to construct it, providing an opportunity to examine the performance of the scale in samples not used to design it and, given the larger sample sizes this collection of datasets provides, the opportunity to examine measurement invariance for a variety of demographic characteristics. We first used the additional 12 datasets to examine the scale with a confirmatory factor analysis (CFA) and used all 14 datasets to evaluate measurement invariance (MI) for gender, age, and race/ethnicity.

Confirmatory Factor Analysis

All items loaded appropriately onto their designated factor. The minimum, standardized factor loadings were .37 for item 17 (reverse-coded, “take risks that could cause trouble for me”) onto the prevention factor, and .46 for item 12 (reverse-coded, “am not highly motivated to succeed”) onto the promotion factor (full CFA loadings are presented in Table 9). The latent association between the two factors was .57. The SRMR and RMSEA were borderline for acceptable fit, at .066 and .083, respectively, and the CFI was .818, which is below the standard cutoff for good model fit of .90. However, the magnitude and direction of the loadings were consistent with what was expected for the model, and, as described above, scale development was not guided purely by methods that would maximize model fit in a simple CFA, but by an IRT analysis, which identified items of varying difficulty that could discriminate between individuals all along the continua of the latent constructs.

Table 9*Confirmatory Factor Analysis of the IPIP Regulatory Focus Scale*

	Promotion	Prevention
Remain hopeful despite challenges	0.61	
Eagerly look forward to things to come	0.67	
Know that I can live my life in any way I want to	0.51	
Like to begin new things	0.59	
Have gotten the important things I want in my life	0.53	
Am not highly motivated to succeed (R)	0.46	
Just know that I will be a success	0.62	
Am excited by many different activities	0.66	
Can easily push myself forward	0.69	
Avoid responsibilities (R)		0.65
Behave properly		0.53
Am careful to avoid making mistakes		0.51
Pay too little attention to details (R)		0.42
Try to follow the rules		0.55
Usually take care of my responsibilities as soon as possible		0.67
Watch out for possible danger		0.39
Neglect my duties (R)		0.71

Take risks that could cause trouble for me (R)	0.37
--	------

Note. CFA utilized 12 samples and 3,876 participants.

With respect to the internal consistency of the scales, the Cronbach's alpha was .82 for the promotion items and .78 for the prevention items. Moving beyond alpha to assess the homogeneity or unidimensionality of a scale, Clark and Watson (2019) recommend that average inter-item correlations be in the .15 to .50 range, with more general measures (e.g., the Big Five traits) on the low end and more specific measures (e.g., facets of the Big Five) on the high end. The average inter-item correlation was .35 for promotion focus and .29 for prevention focus. For promotion focus, interitem correlations ranged from .21 to .55, with most clustered around the mean value (27 of 36 within .10). For prevention focus, interitem correlations ranged from .14 to .59, with most clustered around the mean value (29 of 36 within .10).

Measurement Invariance

For each analysis of MI below, we began with a confirmatory configural model, wherein we examined the magnitude and direction of item loadings onto their relevant latent variable. We then proceeded in a stepwise fashion, constraining loadings, then item intercepts, then error variances. Additionally, we examined constraining latent variable variances/covariances and latent variable means. At each step, we examined the change in CFI, RMSEA, and SRMR from the previous model to determine if constraining certain parameters meaningfully worsened model fit. There is no single, widely accepted value for acceptable levels of change in these fit indices that would indicate no meaningful change in model fit (e.g., see Chen, 2007; Cheung & Rensvold, 2002; Putnick & Bornstein, 2016; Rutkowski & Svetina, 2014). We used a change of $< .01$ in any fit index as an initial guideline for minimal change in model fit, with an understanding that smaller changes in fit would indicate greater similarity, and that changes above but close to .01 might be more indicative of a detectable but small difference. At the initial

configural step, we relaxed typical constraints on CFI, RMSEA, and SRMR to determine “good” model fit (e.g., $CFI \geq .95$, $RMSEA \leq .06$, $SRMR \leq .08$; Hu & Bentler, 1999).

Gender

Participants who responded as man/male ($N = 1891$) were compared to those who responded as woman/female ($N = 2936$). Participants who did not report a gender identification or reported a gender identification other than man (or male) or woman (or female) were excluded from analyses ($N = 40$).

All items loaded appropriately onto the relevant latent construct; for men, one loading was below .3 (item 17; loading = .28; see supplemental materials for full loadings of all MI analyses). The model constraining loadings to be equal for both genders demonstrated only minor changes in model fit within the bounds of $< .01$ (see Table 10). The model constraining intercept invariance had acceptable changes in RMSEA and SRMR, but had a change in CFI of .011, which was just over the initial guideline. Given the minimal changes in the other two fit indices and this marginal change in CFI, we decided to proceed to constraining error invariances. Constraining error invariances did not worsen model fit beyond the specified bounds of change, suggesting that traditional measurement invariance had been met. Finally, constraining latent variable variance/covariances and means did not worsen model fit, suggesting that for men and women, the measurement models could be fully constrained.

Age

We categorized the continuous variable of age into five groups: 18-24 years old ($N = 1364$), 25-34 ($N = 1151$), 35-44 ($N = 705$), 45-59 ($N = 811$), and 60+ ($N = 795$). Participants who did not report an age ($N = 38$) or reported an age less than 18 ($N = 3$) were excluded from analyses. Although imperfectly representative of variation in the population, we settled on these

age groupings as broadly and typically representative of major life changes (e.g., emerging adulthood, early adulthood, early middle age, late middle age, older age), as well as age groups that would have adequate sample sizes.

For all age groups, items loaded onto their appropriate latent construct in the correct direction, and minimum loadings were generally at least .3 (from the youngest to oldest age groups, minimum loadings were .37, .39, .30, .30, and .29). Constraining loadings to be equal across groups did not meaningfully worsen model fit compared to the baseline model. Constraining intercepts led to minimal changes in SRMR and RMSEA, but decreased CFI by .028, beyond the .01 guideline. This decrease in model fit suggests that while factor loadings can be constrained across these age groups, constraining intercepts is not appropriate. Further investigation of the source of the non-invariance suggests that this may be due to the youngest age group (18-24 years old) endorsing riskier behavior and greater avoidance of responsibilities on average. The items demonstrating the largest differences due to age were “take risks that could cause trouble for me” ($\omega^2=.044$; $r = -.19$), “avoid responsibilities” ($\omega^2=.033$; $r = -.18$), and “usually take care of my responsibilities right away” ($\omega^2=.031$; $r = .17$). Age was positively related to prevention focus ($r = .19$) and weakly negatively related to promotion focus ($r = -.05$).

Race and Ethnicity

We compared participants who identified as Black ($N = 257$), Hispanic/Latinx ($N = 212$), Asian ($N = 317$), or non-Hispanic White ($N = 341$). In some studies, participants were allowed to select multiple racial/ethnic identifications; those participants were excluded from these analyses ($N = 196$), except for participants who identified as White and as Hispanic/Latinx ($N = 86$). These participants were classified as Hispanic/Latinx. All other racial/ethnic groups were

excluded from analyses due to insufficient sample sizes (≤ 40), as were those who reported no racial/ethnic identification information ($N = 464$).

All item loadings were in the correct direction and generally had sufficient magnitudes (minimum loadings: Asian = .24; Black = .30; Latinx/Hispanic = .33; White = .35). When constraining loading invariances, all changes were within acceptable bounds. Constraining intercepts also did not worsen model fit, and neither did constraining error variances, suggesting that traditional metrics for MI had been met. Finally, constraining latent variable variances/covariances and means did not meaningfully worsen model fit, suggesting that across the four racial/ethnic groups identified here, the measurement model could be fully constrained.

Table 10

Measurement Invariance Analysis Based on Gender, Age, and Race

Model	Number of Parameters	χ^2	Degrees of Freedom	CFI	RMSEA	SRMR
<i>CFA</i>	55	3680	134	.818	.083	.066
<i>Gender</i>						
Configural	110	4196	268	.824	.078	.064
Loading	94	4262	284	.822	.076	.066
Intercept	78	4512	300	.811	.076	.068
Error	60	4713	318	.803	.076	.069
LV var/covar	57	4742	321	.802	.076	.075
LV mean	55	4836	323	.798	.076	.078
<i>Age</i>						
Configural	275	4655	670	.825	.079	.065
Loading	211	4856	734	.819	.076	.069
Intercept	147	5569	798	.790	.079	.074
<i>Race/ethnicity</i>						
Configural	220	4261	536	.805	.081	.068
Loading	172	4343	584	.803	.078	.070
Intercept	124	4538	632	.796	.077	.072
Error	70	4701	686	.790	.075	.073
LV var/covar	61	4710	695	.790	.074	.073
LV mean	55	4752	701	.788	.074	.074

Discussion

Using data from 12 samples ($N = 3,881$) we confirmed the factor structure identified in Phase 1 of scale construction with all items loading on their appropriate factors. Furthermore, interitem correlations among the scale items followed recommendations (Clark & Watson, 2019) both in terms of average and individual item correlations. Using all data ($N = 4,867$), MI was established for gender (men and women) and race/ethnicity (Black, Hispanic/Latinx, Asian, and non-Hispanic White). For age groups, factor loadings were invariant. However, intercepts could not be constrained with respect to the youngest group (age 18 to 24) compared to older groups.

General Discussion

The overarching goals of this project were to improve understanding of regulatory focus constructs and to provide researchers with a useful measure that adequately assesses the constructs, can distinguish individual differences effectively across the entire range of the constructs, and is appropriate for use in diverse populations. Employing best practices in construct and scale validation (Flake & Fried, 2020), we developed and validated a new measure of regulatory focus using the open-access International Personality Item Pool (Goldberg et al., 2006). Drawing on theory and expert knowledge, we identified a pool of potential items that could index promotion or prevention focus. Using the Eugene Springfield Community Sample and a Mechanical Turk Sample, we employed IRT to identify items that could reliably discriminate between people all along the continua of the promotion and prevention constructs. Additionally, we examined relations of the new measure with previous measures of regulatory focus, related constructs, the Big Five, and relevant criterion behaviors. Finally, using a large collection of data sets, we examined MI with respect to gender, age, and race/ethnicity.

Construct Validation of the New Measure

Flake and others (e.g., Clark & Watson, 2019; Flake et al., 2017; Flake & Fried, 2020) have critiqued the social psychological literature for haphazard measurement practices and have reiterated the need to embrace construct validation techniques that move beyond reliance on Cronbach's alpha and/or factor analysis. Drawing on seminal works on construct validation and measurement, Flake et al. (2017) suggested that validation should involve three phases: *substantive*, *structural*, and *external*. With respect to the *substantive* phase, we identified, based on our reading of the regulatory focus literature, a large and inclusive pool of potential scale items from the thousands of items in the open-access IPIP (Goldberg et al., 2006). Additionally, outside experts in regulatory focus theory provided ratings of the potential items. We and the outside experts showed substantial overlap in our ratings and included items that showed at least moderate agreement in subsequent construct validation efforts.

In the *structural* phase, we examined the items in the ESCS (Goldberg & Saucier, 2016) and an MTurk sample. In exploratory factor analyses of each sample, we were able to identify items that loaded highly on two factors that appeared to capture promotion focus and prevention focus. At this point, we could have chosen items that maximized model fit and the internal consistency of each subscale. However, because we wanted to create relatively short scales that could reliably assess individuals all along the continua of each latent construct, we utilized IRT analysis (Reise et al., 2005). Through IRT analysis we were able to identify nine promotion and nine prevention items that were highly discriminating items of varying difficulty. The information curves for each scale were relatively balanced across that entire range of each latent construct. However, it should be noted that discrimination on the upper end of each construct was somewhat attenuated relative to the lower end.

Further establishing the structural validity of the measure, we examined the average and distribution of inter-item correlations for each scale. In this respect, the scales conformed to recommendations by Clark and Watson (2019). With respect to MI, the measurement model could be fully constrained across the gender and race/ethnicity groups that were examined. Although the factor loadings could be constrained across age groups, the intercepts could not be. In general, endorsing risky behavior and avoidance of responsibility was greater in younger versus older people.

With respect to the *external* phase of scale construction, we examined convergent, discriminant, and predictive validity. The IPIP promotion scale generally converged with the RFQ and GRFM promotion scales. Similarly, the promotion subscales were generally, positively related to BAS scales (especially drive) and negatively related to BIS. The IPIP prevention scale converged to some extent with the RFQ prevention scale; however, both the IPIP and RFQ prevention scales were negatively related to the GRFM prevention scale. Similarly, both IPIP and RFQ prevention scales were negatively related to BAS fun seeking; however, GRFM prevention was unrelated to fun seeking, but was positively related to BIS. These associations with BAS and BIS constructs are generally similar to those reported by Summerville and Roese (2008) and Haws et al. (2010). With respect to the Big Five, greater IPIP promotion was related to greater extraversion, openness (especially the intellect aspect), and conscientiousness (especially the industriousness aspect), and lower neuroticism (especially the withdrawal aspect). Greater IPIP prevention was related to greater conscientiousness and agreeableness (especially the politeness aspect), and lower neuroticism. These associations are generally similar to those reported in prior work (e.g., Grant & Higgins, 2003; Higgins, 2008; Ouyang et al., 2015; Vaughn et al. 2008), but differences are discussed below.

Finally, IPIP promotion and prevention scales showed distinct patterns of predictive validity: the promotion-related behaviors reflect an eager engagement with the world and cognitive and behavioral flexibility, whereas the prevention-related behaviors reflect a focus on safety, security, and the fulfillment of obligations. In predicting everyday behaviors, virtually all associations with promotion focus were positive (e.g., made a new friend; laughed when no one else was; finished a large project) and all associations with prevention focus were negative (e.g., drove or rode without a seatbelt; arrived more than an hour late; drank alcohol or used other drugs to feel better). With respect to health behaviors, both promotion and prevention were positively related to a healthy lifestyle. However, prevention was positively related to risk avoidance and calorie/fat trimming behaviors, whereas promotion was negatively related to risk avoidance and unrelated to calorie/fat trimming. Importantly, prevention focus showed incremental predictive validity controlling for conscientiousness.

In the context of perceived value similarity with romantic partners, we were able to directly compare results using the IPIP-RFS and the RFQ. With respect to the importance of core values, the IPIP-RFS showed a more coherent pattern than the RFQ. Those more predominantly prevention-focused were more likely to endorse conformity, tradition, security, and benevolence, whereas those more predominantly promotion-focused were more likely to endorse self-direction, achievement, stimulation, and hedonism. Using the IPIP-RFS, perceived value similarity between oneself and one's romantic partner was positively associated with relationship and personal well-being for individuals whose motivational concerns relate to safety, obligation, and stability (i.e., prevention focus). Using the RFQ, promotion focus was the most consistent moderator between value similarity and well-being.

Understanding the Constructs of Promotion Focus and Prevention Focus

Promotion focused people appear to have a “good” or typically desirable personality. That is, they are higher in extraversion, agreeableness, conscientiousness, and openness, and lower in neuroticism. In particular, higher promotion focus is related to less withdrawal and greater enthusiasm, assertiveness, industriousness, and intellect. With respect to behavioral activation and inhibition, greater promotion focus aligns with greater BAS (especially the drive aspect) and lower BIS, which fits with its theoretical basis of eager goal pursuit. High prevention people appear to have a “dutiful” personality. Greater prevention is related to greater industriousness, orderliness, and politeness. These relations were stronger with the IPIP measure relative to the RFQ. With respect to behavioral activation and inhibition, prevention was positively related to BAS reward and drive, but negatively related to the more impulsive subscale fun-seeking. Prevention was largely unrelated to BIS, suggesting the prevention-related goal pursuit will often reflect the need to override inhibition. This non-association could reflect two countervailing forces. That is, threat sensitivity may incline people to be more prevention focused, but being prevention focused can help to mitigate and avoid threats, leading people to have fewer experiences of negative affect.

Although the promotion scale of the GRFM showed some convergence with the IPIP and RFQ scales, the GRFM prevention scale seems to most align with neuroticism and behavioral inhibition. Findings related to the GRFM (and more specific measures derived from it; Ferrer et al., 2017; Lanaj et al., 2012; Rodrigues et al., 2019; Winterheld & Simpson, 2011) are probably best interpreted through the lens of BAS/BIS or extraversion/neuroticism. Echoing Summerville and Roese (2008), the GRFM appears to reflect a reference point definition of regulatory focus involving a focus on the presence or absence of gains (promotion) or losses (prevention).

Our new measure and the RFQ both appear to reflect a self-guide definition involving a focus on achieving aspirations and pursuing goals (promotion) or fulfilling responsibilities and maintaining safety or security (prevention). In this way, promotion focus and prevention focus both involve goal pursuit and self-regulation but, in line with original regulatory focus theory (Higgins, 1997), reflect different systems for pursuing rewards and avoiding punishments. However, between the two systems, the strategies of goal pursuit differ (eagerness versus vigilance) and the nature of those pursuits vary (growth, advancement, and novelty versus maintenance, commitment, and duty). Previous research has demonstrated that promotion focus is beneficial for initiating behavioral change and goal attainment, whereas prevention focus is beneficial for maintaining behavioral change and goal maintenance (Brodner et al., 2007; Fuglestad et al., 2008, 2013, 2015).

Our new IPIP measure shows more correlation between promotion and prevention than prior measures, which can be explained by the fact that both foci involve increased self-regulation and goal-directed behavior. The fact that all prevention items in the RFQ focused on experiences with parents, whereas no RFQ promotion items did, may have attenuated the correlation between foci in the RFQ. Although the motivational concerns, behavioral domains, and strategies employed vary across foci, both share commitment to the overarching pursuit of goals.

Potentially accounting for the wide-ranging effects of regulatory focus in the social psychological literature, promotion focus and prevention focus appear to align reasonably well with the most foundational aspects of personality—the metatraits plasticity and stability. This was true for both our new IPIP measure and the RFQ, although the pattern was most clear with the IPIP-RFS. Promotion-related goal pursuit and self-regulation, therefore, appear to involve

cognitive and behavioral flexibility, exploration, and incentive motivation, as well as desire for and comfort in dealing with novelty (DeYoung, 2013). On the other hand, prevention-related goal pursuit and self-regulation appear to involve maintaining steadiness in motivation and interpersonal relations. DeYoung (2015) suggested that the metatraits reflect variation in the mechanisms related to two fundamental needs: a) maintaining stability by resisting impulses and distractions so that goals can be accomplished and b) plastically adapting to complex and changing conditions to develop new goals and/or new strategies of goal pursuit. In an analysis of IPIP items related to stability and plasticity (derived from self- and informant reports of the Big Five Inventory), “try to follow the rules,” “get out of control,” and “find myself in the same kinds of trouble, time after time,” were among the items most related to stability (the latter two negatively), clearly implicating prevention focus (DeYoung, 2010). In contrast, “am able to come up with new and different ideas,” “look forward to the opportunity to learn and grow,” and “am interested in many things,” which clearly reflect a promotion focus, were among the items most related to plasticity.

Further supporting parallels with the metatraits, Hirsh et al. (2009) examined associations of plasticity and stability with the same everyday behaviors examined in the present analysis. Like the findings with promotion and prevention focus, almost all of the associations with plasticity were positive and almost all of the associations with stability were negative. Furthermore, the everyday behaviors most related to promotion focus (and plasticity) reflect an eager engagement with the world and cognitive and behavioral flexibility. In contrast, the behaviors most related to prevention focus (and stability) reflect an emphasis on safety, security, and the fulfillment of duties and interpersonal obligations. Hirsh et al. (2009) also demonstrated that stability was negatively associated with engagement in sexual behaviors, whereas plasticity

was positively associated with these behaviors. A similar pattern can be seen with risky health behaviors in the present analysis: promotion focus was negatively related to risk avoidance, whereas prevention focus was positively related.

Strengths, Limitations, and Future Directions

Though our findings support the effectiveness and usefulness of our new measure of regulatory focus, it is important to note that scale development is an iterative process, and that each stage of scale development can be characterized by strengths and limitations for future work to build on. In terms of the *substantive* stage of scale development, a common limitation in scale development is that sets of items do not reflect the full breadth of a given construct (Flake et al., 2017). In contrast, our project followed best practice in scale development (Clark & Watson, 2019; Flake et al., 2017) by starting with a large initial pool of 141 items selected to reflect a wide range of possible items that could be used to reflect the two regulatory foci. We then ensured we selected a strong subset of items for psychometric evaluation by consulting with experts in regulatory focus theory, who showed good agreement on the best items to use. This procedure increases our confidence in the substantive validity and representativeness of our items. That said, we note that regulatory focus research is a vast area, and that other experts might differ in their selection of items. Consequently, maintaining a critical eye on the composition of the scale, and on ways items can be improved, may allow future improvements to the IPIP-RFS.

In the *structural* phase of scale development, our project benefitted strongly from the use of 14 samples, affording high power to evaluate our measures. This strength was further reinforced with the use of modern psychometric analyses such as IRT. Whereas traditional methods usually give singular indices to reflect reliability (e.g., Cronbach's alpha), IRT allowed

us to ensure that the scale could equally measure respondents across the *range* of latent scores. IRT further allowed us to ensure that items were highly effective at discriminating between higher and lower scores across the range of these dimensions. That said, we acknowledge that model fit indices for the general CFA models were somewhat lower than conventional cut-offs. However, this is to be expected because the constructs are relatively broad—tapping into two general orientations of self-regulation and goal pursuit—and, generally, factor loadings for items assessing high-level constructs should be lower than for narrowly-defined constructs (Clark & Watson, 2019). Consequently, model fit cut-offs should not be the same as for narrowly defined constructs. Instead of focusing on model fit, we focused on maximizing the precision-efficiency tradeoff by optimizing strong information curves using a relatively small number of items for each focus. The resulting measure is efficient, but future research could build on this in two ways. First, researchers could work on a longer-form version of the scales to maximize precision, and second, a shorter form could be developed with a focus on efficiency for use in large scale data collection efforts.

We also moved beyond many scale development efforts by assessing MI across a range of demographic characteristics. These analyses support the usefulness of the measure to compare a variety of populations along gender, age, and racial/ethnic lines, for which most comparisons met criteria for MI. There was a notable exception for younger participants aged 18-24 who did not appear to have comparable intercepts with older age groups. Future efforts may therefore wish to examine whether the scales can be adapted to increase comparability across age groups, or whether regulatory focus as a construct may operate differently during early (versus later) adulthood. In relation to our structural analyses, we note that all data were collected in the United States; consequently, MI in other cultural contexts is unknown. Similarly, the groups

investigated were constrained to only a few categories (e.g., men versus women, age groups, and four racial/ethnic groups), overlooking many other important comparisons (e.g., comparing cis versus trans populations, and racial/ethnic comparisons common outside the United States). Additional research is warranted to examine the function of the scales across groups not represented in the current analysis.

Our analyses provide a rich set of findings for the *external* phase of scale development. This includes a comparison of our measure against the two most widely used measures of regulatory focus previously available (the RFQ and GRFM). It also includes an exploration of the nomological positioning of our measure within the Big Five framework of personality. Such a positioning is not only valuable to understand in its own right, but the vast documentation of relations between Big Five constructs and other individual differences in the literature can help researchers make informed predictions about how our measures may relate to traits not assessed in the current project. That said, we acknowledge that we examined only self-report measures. Informant data on our measure would be beneficial to assess agreement between self-ratings and informant data and to account for biases inherent in self-reports (e.g., inflated inter-item correlations due to common method variance and response biases like acquiescence). Furthermore, we encourage other researchers to use our measure with existing measures to further explore its comparative usefulness and validity.

Lastly, predictive validity was preliminary and limited to self-report data. The use of objective behavioral assessments, along with experimental or longitudinal data, would further benefit our ability to draw causal conclusions about the extent to which promotion and prevention foci as indexed by the IPIP-RFS relate to self-regulatory strategies, goal attainment and maintenance, emotional reactions to success and failure (i.e., cheerfulness vs. dejection;

quiescence vs. agitation), and regulatory fit. Although we did not examine regulatory fit in a conventional manner, our results regarding value similarity suggest something analogous to regulatory fit for prevention focus. That is, value congruence is more important for those high in prevention, so for them, having a partner with similar values demonstrates regulatory fit. Additionally, Joyal-Desmarais et al. (2020) found evidence of fit using the IPIP-RFS scale. Specifically, they found that messages that fit people's promotion focus (i.e., gain-framed) were more persuasive/appealing than messages that did not fit (i.e., loss-framed). They did not find the corresponding effects for prevention focus, but prevention did predict as a main effect.

Conclusion

In line with best practice recommendations for scale construction (e.g., Clark & Watson, 2019; Flake & Fried, 2020) we created a new measure of regulatory focus that adequately assesses the constructs of promotion focus and prevention focus, can accurately assess individuals all along the continua of the constructs, and is suitable for use among populations that vary in terms of gender, race, and age. Further, we were able to position regulatory focus in the context of broader personality. Individual differences in promotion focus reflect self-regulation and goal pursuit related to broad themes of cognitive and behavioral exploration and flexibility (i.e., plasticity), whereas individual differences in prevention focus reflect self-regulation and goal pursuit related to motivational and interpersonal steadiness (i.e., stability). Promotion and prevention focus are important elements of personality with broad implications for functioning and outcomes in health and other important domains.

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Appendix

IPIP Regulatory Focus Scale

Here are a number of characteristics that may or may not describe you. Please fill in the number that best indicates the extent to which you agree or disagree with each statement listed below.

1	2	3	4	5
Strongly Disagree		Neither Agree Nor Disagree		Strongly Agree

- _____ 1. Avoid responsibilities
- _____ 2. Remain hopeful despite challenges
- _____ 3. Behave properly
- _____ 4. Eagerly look forward to things to come
- _____ 5. Am careful to avoid making mistakes
- _____ 6. Pay too little attention to details
- _____ 7. Know that I can live my life in any way I want to
- _____ 8. Like to begin new things
- _____ 9. Try to follow the rules
- _____ 10. Have gotten the important things I want in my life
- _____ 11. Usually take care of my responsibilities as soon as possible
- _____ 12. Am not highly motivated to succeed
- _____ 13. Watch out for possible danger
- _____ 14. Neglect my duties
- _____ 15. Just know that I will be a success
- _____ 16. Am excited by many different activities
- _____ 17. Take risks that could cause trouble for me
- _____ 18. Can easily push myself forward

Scoring: reverse score items 1, 6, 12, 14, and 17; promotion focus: compute mean of items 2, 4,

7, 8, 10, 12, 15, 16, 18; prevention focus: compute mean of items 1, 3, 5, 6, 9, 11, 13, 14, 17