Routledge
Taylor & Francis Group

The Journal of Positive Psychology

Dedicated to furthering research and promoting good practice

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/rpos20

Primal world beliefs correlate strongly but differentially with character strengths

Alexander G. Stahlmann & Willibald Ruch

To cite this article: Alexander G. Stahlmann & Willibald Ruch (2023) Primal world beliefs correlate strongly but differentially with character strengths, The Journal of Positive Psychology, 18:4, 481-491, DOI: 10.1080/17439760.2022.2070532

To link to this article: https://doi.org/10.1080/17439760.2022.2070532

Published online: 08 May 2022.

THE JOURNAL OF POSITIVE PSYCHOLOGY
2023, VOL. 18, NO. 4, 481–491
https://doi.org/10.1080/17439760.2022.2070532

Routledge
Taylor & Francis Group

Primal world beliefs correlate strongly but differentially with character strengths

Alexander G. Stahlmann and Willibald Ruch

Department of Psychology, University of Zurich, Zurich, Switzerland

ABSTRACT

Primal world beliefs–primals–are a category of beliefs about the overall character of the world (e.g., the world is a *safe* place). Theory suggests that such beliefs drive personality development–or at least reflect personality differences, such as character strengths. We examined the relationships of primals with character strengths among 1122 German-speaking adults. The primary primal *good* explained the most variance in most character strengths, especially hope, spirituality, zest, gratitude, curiosity, and leadership. Including specific secondary (e.g., *safe, enticing, alive*) and tertiary primals (e.g., *beautiful, needs me, funny*) often yielded better predictions, but, with few exceptions, increments were typically smaller than that of the primary primal. We recommend including these primals in positive psychology interventions and describe three couplings of primals and character strengths that may prove especially fruitful for future research and practice.

ARTICLE HISTORY
Received 18 August 2021
Accepted 15 March 2022

KEYWORDS
Positive psychology; primals; beliefs; VIA classification; positive psychology interventions

Beliefs and assumptions that describe reality–worldviews–are the subject of a growing body of literature that highlights their importance in explaining personality differences (e.g., Dweck, 2017; Fleeson & Jayawickreme, 2015; Koltko-Rivera, 2004). Recently, Clifton and colleagues (2019) compiled a catalog and measure that allows for differentiating worldviews that pertain to the world's overall characteristics: *primal world beliefs*–or *primals* for short. Their research provided first evidence that the character strengths hope, gratitude, and curiosity correlate strongly with several primals, such as believing that the world is a *good, enticing*, and *interesting* place. Based on these and similar findings in the Big Five, Clifton (2020a) proposed that primals play an important role in personality development or can at least contribute to describing and predicting personality differences. This study seeks to extend Clifton and colleagues' (2019) research by investigating the relationships of primals with every character strength of Peterson and Seligman's (2004) VIA classification. Understanding which primals relate to which character strengths will enable us to make informed decisions on which primals we might consider when attempting to change character strengths through positive psychology interventions.

Primals may constitute personality

Recent years have seen renewed interest in worldviews, which Koltko-Rivera (2004, p. 3) defined as 'a set of assumptions about physical and social reality that may have powerful effects on cognition and behavior.' Nowhere have such assumptions received more attention than in cognitive therapy, in which Beck's (e.g., Beck & Alford, 2009; Beck, 1967) cognitive or primary triad lists a negative view of the world as one of the main characteristics of depression. If we accept that viewing the world in a particular way contributes to sustaining a mental disorder, we must assume that worldviews sensibly affect how individuals think, feel, and act. Indeed, this idea can be found in many contemporary personality theories, such as in Dweck's (2017) BEATs theory ('beliefs'), Fleeson and Jayawickreme's (2015) Whole Trait Theory ('beliefs'), and Geukes et al. (2018) integrative state process model ('world-views'). For example, Dweck (2017) proposes that personality can be seen as a characteristic way toward fulfilling basic needs given the beliefs, emotions, and action tendencies that emerged from previous experience. Notably, while other theories have considered personality the *cause* of cognition, affect, and behavior (e.g., Eysenck & Eysenck, 1985; McCrae & Costa, 1999), the theories that include worldviews instead make personality their *product* or *reflection*. If these or similar theories proved to be valid, we might situate worldviews at the center of our understanding of personality development (product) or personality differences (reflection).

Primals are an important category of worldviews because they are goal-relevant (essential to individuals' interests, needs, or values), active (dynamically directing attention and guiding action), and measurable (by questionnaire, but also text-based analysis; Clifton et al.,

CONTACT Alexander G. Stahlmann alexanderstahlmann@googlemail.com

2019). Clifton and colleagues (2019) identified primals by analyzing recurring themes in historical and contemporary literature, social media, and focus groups from around the world. Their search ultimately led to the selection of 22 of such beliefs (tertiary primals), most of which collapsed into a handful of higher-order factors (secondary primals) and one general factor (primary primal). Examples include believing that the world *needs me* and my efforts (tertiary primal), that it is an *enticing*, fascinating place (secondary primal), and that it is a *good*, delightful place (primary primal). Primals can be measured by self-report using the Primals Inventory, which was developed initially in American English but has since been adapted successfully into German with more translations on the way (2022; Stahlmann et al., 2020). While several worldview categories will presumably prove important in predicting personality, primals are an ideal research subject because we know their number and structure and can measure them reliably.

Understanding primals enables designing corresponding strength-based interventions

Initial research found that primals correlate sensibly with the Big Five, character strengths, well-being, and, most recently, post-traumatic growth following the COVID-19 pandemic (Clifton et al., 2019; Stahlmann et al., 2020; Vazquez et al., 2021). The primary primal *good* proved to be especially important: believing that the world is a *good* place correlated strongly with higher scores on agreeableness, extraversion, optimism, gratitude, curiosity, subjective well-being, and flourishing. Several secondary and tertiary primals sustained similar, albeit often smaller correlations with these measures. Exceptions are the secondary primal *alive*, which correlated uniquely with higher religiosity, conservatism, and gender (higher in females), and the tertiary primals *acceptable, changing*, and *hierarchical*, which are largely unsaturated by the primary primal. While these results painted a preliminary picture of primals' nomological network, they fell short of disentangling the prominent role of the primary primal from the unique contributions of secondary and tertiary primals to these correlations. Moreover, they only describe primals' correlations with three out of the 24 character strengths of the VIA classification.

Knowing the correlations of primals with all character strengths is important because it allows us to design positive psychology interventions that develop specific character strengths through their associated primals. Although primals have been shown to be generally as stable as the Big Five, they should not be considered immutable (see Clifton, 2020b; Clifton et al., 2019). Quite the opposite, the success of programs such as Beck's (e.g., Beck & Alford, 2009; Beck, 1967) cognitive therapy and Dweck and colleagues' (e.g., Dweck, 2017) growth mindset interventions suggests that primals can be changed by targeted intervention. Clifton (2020a) gives an example for one such intervention through what he calls 'Homeland Tourism'–developing the belief in a *beautiful* world by prompting participants to notice and remember the beauty surrounding their residence. As the belief in a *beautiful* world is embedded in that in a *good* world and believing in a *good* world is correlated with the character strength gratitude, this intervention should develop gratitude through building up a complementary belief system. It follows that we will be able to design and eventually test similar interventions for other important character strengths once we know the primals they are associated with. In particular, we need to identify those primals that drive such relationships and differentiate them from those that contribute only little or nothing to explaining character strengths.

Aims of this study

In this study, we determine the most important relationships of primals with character strengths using correlation and regression analysis. This allows researchers to learn which primals are most relevant for the character strengths they would like to investigate or target by intervention. We begin with analyzing zero-order correlations and proceed to analyze the primary, secondary, and tertiary primals' unique contributions by using sequential (hierarchical) linear regression: for every character strength, we will build a zero-order model using the primary primal, then build a first-order model regressing the secondary primals on the zero-order model's residuals, and finally build a second-order model regressing the tertiary primals on the first-order model's residuals. As a result, we will report which primals proved to be the most predictive across the different character strengths and present a list that connects every character strength with a specific number of those primals. Finally, we will discuss three couplings of primals and character strengths which–based on theory and our results–we would consider to be the most promising for future research and practice.

Method

Participants and procedure

We analyzed data from $N = 1122$ German-speaking participants (65.69% female, 33.06% male, 1.25% unspecified/other; $M_{age} = 40.20$ years, $SD_{age} = 12.17$ years, range = 18–75 years). Most were Germans (68.63%), Swiss (19.79%), and Austrians (8.73%). Almost three-thirds had been

enrolled in tertiary/higher education programs (60.25%), and the remainder had received upper secondary (29.32%), lower secondary (9.00%), or less education (1.43%). About three quarters were employed (75.22%) and about half of the remainder comprised students (14.97%).

We retrieved the data from the German online survey platform charakterstaerken.org, which offers individuals to contribute their data in exchange for customized feedback about their personality and well-being. Participants provided informed consent before registration and had to be at least 18 years old and fluent in German. They were able to self-select the surveys which they would like to complete. All participants provided full data on primals and character strengths. Stahlmann et al. (2020) previously analyzed parts of this sample (n = 437) with different objectives and methods.

Measures

The *German Primals Inventory* (PI-66-G; Stahlmann et al., 2020) comprises 66 items to assess 29 primals at three levels of granularity: 22 tertiary primals (e.g., *harmless, interconnected, understandable*), six secondary primals (*safe, enticing, alive, empowering, communal, fluid*), and one primary primal (*good*). Tertiary primals are measured by three items per scale, while secondary and primary primals are computed by recombining specific tertiary primals (e.g., *communal* is computed by taking the mean of the tertiary primals *cooperative, hierarchical* [negatively keyed], *interconnected*, and *progressing*). The inventory uses a six-point scale (0 = *strongly disagree* to 5 = *strongly agree*) and yields good internal consistency (Cronbach's alpha in this study ranged from .67 [*just*] to .91 [*interconnected*] with *Med* = .81).

The *German VIA Inventory of Strengths* (VIA-IS; Ruch et al., 2010) comprises 240 items to assess the 24 character strengths of the VIA classification (e.g., courage, perseverance, forgiveness). Character strengths are measured by ten items per scale. The inventory uses a five-point scale (1 = *very much unlike me* to 5 = *very much like me*) and yields good internal consistency (Cronbach's alpha in this study ranged from .74 [self-regulation] to .90 [spirituality] with *Med* = .78).

Analysis

We conducted our analyses within the R statistical computing environment (R Core Team, 2021). We computed the correlations' p-values using Revelle's (2021) *psych* package. We built, selected, and cross-validated the sequential regression models using Kuhn's (2021) *caret* package. We estimated all linear model statistics using 200 tenfold-cross-validation samples. In models that included secondary and tertiary primals, we used recursive feature elimination to automatically exclude primals that did not substantially contribute to the predictions. As such, primals that were excluded by the algorithm do not appear in the tables. We adjusted p-values across all correlation and regression tests reported in this paper (m = 2262) using Holm's correction. We additionally computed partial correlations of primals with character strengths controlled for age, gender, and education. The partial correlations are available online at OSF (https://doi.org/10.17605/OSF.IO/F573G).

Results

Zero-order correlations of primals with character strengths and the sequential linear models regressing primals on character strengths (and on zero- and first-order residuals for secondary and tertiary primals) are in Tables 1–4. We visualized our sequential models' results in Figure 1.

Correlations

The primary primal *good* correlated positively with every character strength, except judgment, humility, and prudence. The numerically strongest relationships were with hope (r = .57), spirituality (r = .55), zest (r = .54), gratitude (r = .47), and curiosity and leadership (r = .44).

The secondary primals *safe, enticing, alive, empowering*, and *communal* mirrored this pattern, although the effect sizes were generally smaller. Notable exceptions were the correlations of *safe* with forgiveness (r = .35) and humor (r = .38); *enticing* with curiosity (r = .46), love of learning (r = .32), love (r = .44), kindness (r = .35), teamwork (r = .34), fairness (r = .29), forgiveness (r = .35), appreciation of beauty (r = .28), and gratitude (r = .48); and *alive* with honesty (r = .18) and spirituality (r = .68). The secondary primal *fluid* only yielded correlations with four strengths, all involving small effect sizes.

The tertiary primals that are largely saturated by the primary primal and the secondary primals *safe, enticing*, and *alive* (all except *acceptable, changing*, and *hierarchical*) again mirrored the pattern described above, although the effect sizes were even smaller. Notable exceptions were the correlations of *just* with honesty (r = .22); *funny* with humor (r = .57); and *worth exploring* with love of learning (r = .39). The tertiary primal *acceptable* yielded no correlations with character strengths while *changing* correlated positively with creativity (r = .15), curiosity (r = .13), love of learning (r = .13), appreciation of beauty (r = .16),

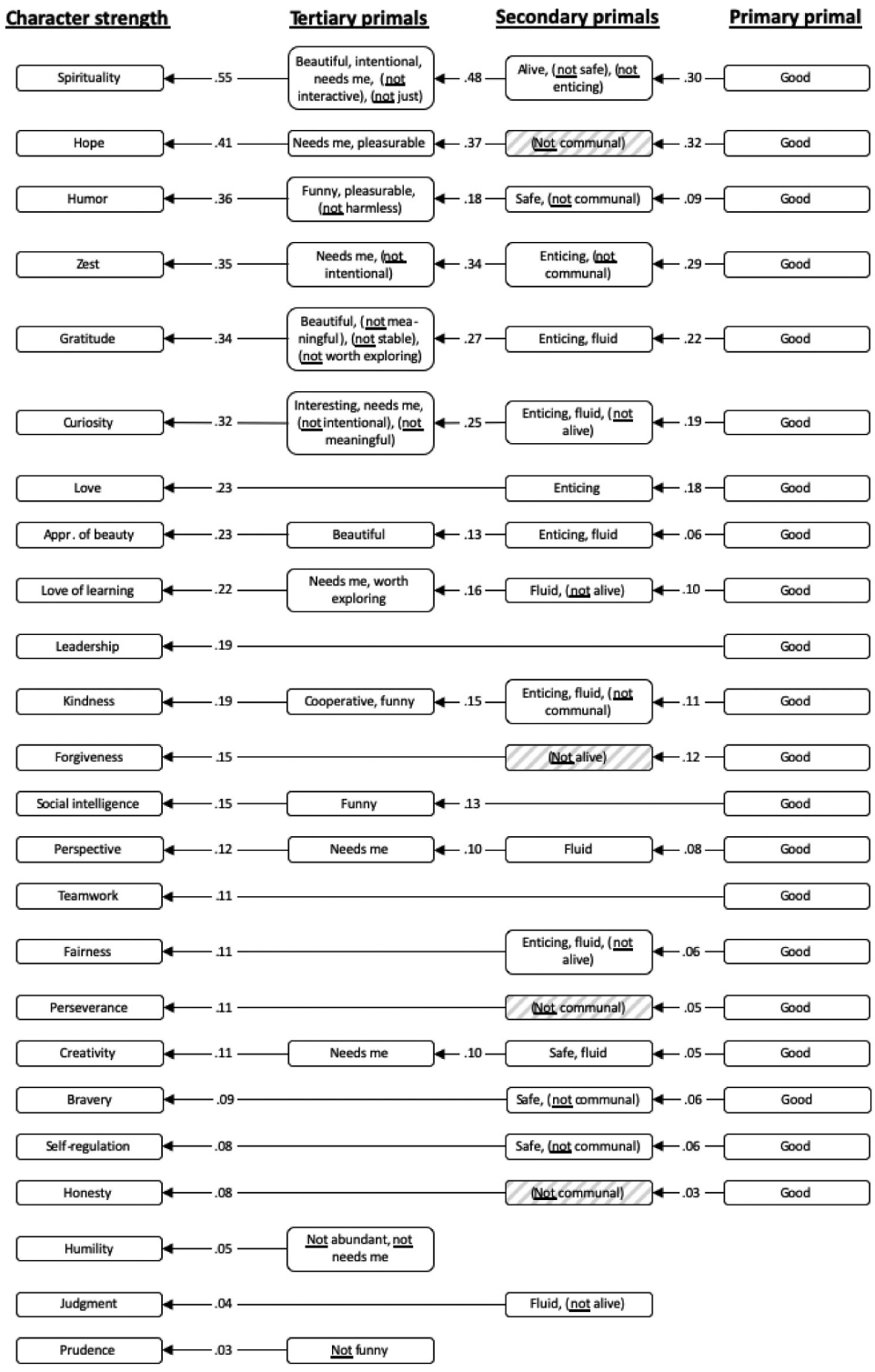

Figure 1. Visualization of the sequential models regressing primals on character strengths. Note: The boxes only include significant predictors. The arrows depict the models' adjusted R2: for example, including good when predicting love explained 18% of variance in love and additionally including enticing explained 20% of variance. Suppressors are printed in parentheses and shaded if they did not contribute notably to enhancing any other primal's effect (i.e., in perseverance, honesty, forgiveness, and hope).

Table 1. Zero-order correlations and sequential linear models regressing primals on character strengths (part 1/4).

	Creativity		Curiosity		judgment		Love of learning		Perspective		Bravery	
R^2_{adj} Primary primal		.05		.19		.00		.10		.08		.06
Good	.23*	.23*	.44*	.44*	.03	.03	.31*	.31*	.28*	.28*	.24*	.24*
R^2_{adj} Secondary primals		.10		.25		.04		.16		.10		.09
Safe	.21*	.17*	.38*		.06	.11	.28*	.07	.24*	.13	.24*	.16*
Enticing	.15*	−.12	.46*	.27*	.04	.03	.32*	.16	.20*		.19*	
Alive	.20*		.29*	−.24*	−.02	−.16*	.21*	−.21*	.24*		.17*	
Empowering	.16*	.07	.13*		.12*	.09	.13*		.14*		.16*	.06
Communal	.13*		.29*		.02	.06	.24*	.06	.12	−.12	.08	−.16*
Fluid	.11	.20*	−.02	.20*	.11	.19*	.08	.28*	.03	.13*	.02	.09
R^2_{adj} Tertiary primals		.11		.32		.04		.22		.12		.11
Abundant	.16*		.34*		.05		.26*		.16*		.15*	
Acceptable	−.07		−.01		−.09		−.02		−.04		−.09	
Beautiful	.14*		.36*		.01		.25*		.19*		.16*	−.09
Changing	.15*		.13*		.10		.13*		.07		.08	
Cooperative	.05		.21*		−.02		.14*		.08		.05	
Funny	.19*		.24*		.03		.20*		.17*		.21*	.07
Harmless	.11		.24*		.03		.15*		.15*		.13*	−.08
Hierarchical	.03		−.05		.00		−.08		.09		.05	
Improvable	.20*		.22*		.11		.20*		.21*		.18*	
Intentional	.12		.15*	−.17*	−.06		.09	−.15	.16*	−.10	.11	−.08
Interactive	.17*		.19*		.00		.16*		.18*		.10	−.07
Interconnected	.18*		.21*		.04		.20*		.17*		.09	
Interesting	.07		.41*	.16*	.04		.23*		.10		.10	
Just	.10		.17*		−.07	−.09	.10		.16*		.14*	
Meaningful	.07	−.13	.27*	−.21*	.00		.17*	−.14	.14*	−.08	.14*	
Needs me	.23*	.14*	.33*	.30*	.00	.08	.24*	.29*	.26*	.20*	.21*	.15
Pleasurable	.07		.30*		−.04		.15*		.11		.13*	
Progressing	.11		.26*		.05		.19*		.10		.10	
Regenerative	.14*		.29*		.05		.19*	−.10	.20*		.17*	
Stable	.00		.13*		−.04		.05		.09		.04	
Understandable	.19*		.23*		.07		.20*		.20*		.24*	.11
Worth exploring	.20*		.39*		.14*		.39*	.16*	.18*		.17*	

Note. For every character strength, the first decimal per primal refers to the zero-order correlations and the second decimal per row refers to the zero-, first- and second-order models, respectively. Adjusted R^2 and standardized slopes are based on recursive feature elimination in 200 tenfold-cross-validation samples. Primals that were excluded by recursive feature elimination do not appear in the tables. P-values were adjusted across all correlation and regression tests (m = 2262) using Holm's correction. Significant slopes are marked with asterisks (*).

and gratitude (r = .17). *Hierarchical* correlated positively with perseverance (r = .19) and self-regulation (r = .14) and negatively with fairness (r = −.13) and forgiveness (r = −.14).

Sequential linear regressions

Overall, the regression analyses substantiated that the primary primal *good* explains the largest share of variance in most character strengths. Including secondary or tertiary primals often yielded more prediction power, but with only few exceptions, the increment was considerably smaller than that provided by the primary primal. A number of secondary and tertiary primals that sustained positive zero-order correlations yielded negative slopes in the regression models. This suggests that such primals are *suppressors*: their positive zero-order correlations presumably stemmed from the shared variation with different, more predictive primals, and they were only included in the regression models because they suppressed irrelevant variance, thus enhancing the effects of some of the other predictors (Lancaster, 1999; Tzelgov & Henik, 1991). For example, *alive, communal*, and *fluid* sustained only weakly positive or no zero-order correlations with most character strengths. However, including them in the linear models often made *alive* and *communal* negative predictors and enabled *fluid* to emerge as positive predictor, such as in judgment, love of learning, and kindness. Strictly speaking, primals that only become important when considering suppressors cannot contribute uniquely to any prediction. In the following paragraphs, we hence will not describe such primals' and the suppressors' contributions to the models. In Figure 1, we put the suppressors in parentheses and shaded those which did not contribute notably to enhancing any other primal's effect (i.e., on perseverance, honesty, forgiveness, and hope).

As informed by the correlations, the primary primal *good* emerged as positive predictor of every character strength, except judgment, humility, and prudence. R^2 ranged from .00 (judgment, humility, prudence) to .32 (hope) with *Med* = .09.

Beyond the primary primal, the secondary primals *safe, enticing*, and *alive* emerged as positive predictors of several character strengths, *fluid* emerged as positive predictor mostly when *alive* and *communal* functioned

Table 2. Zero-order correlations and sequential linear models regressing primals on character strengths (part 2/4).

	Perseverance		Honesty		Zest		Love		Kindness		Social intelligence	
R^2_{adj} Primary primal		.05		.03		.29		.18		.11		.13
Good	.23*	.23*	.16*	.16*	.54*	.54*	.42*	.42*	.33*	.33*	.36*	.36*
R^2_{adj} Secondary primals		.11		.08		.34		.20		.15		.14
Safe	.20*	.15	.13*	.12	.48*	.12	.36*	−.05	.30*	.08	.25*	−.07
Enticing	.19*	.03	.13*		.51*	.18*	.44*	.23*	.35*	.20*	.32*	.09
Alive	.20*	.06	.18*	.09	.39*	−.07	.29*	−.12	.24*	−.11	.33*	
Empowering	.19*	.08	.16*	.07	.20*		.14*		.15*		.09	
Communal	.00	−.28*	−.02	−.22*	.25*	−.25*	.27*	−.08	.16*	−.15*	.22*	
Fluid	.03	.06	.10	.11	−.11	.07	−.13*		−.01	.13*	−.01	.08
R^2_{adj} Tertiary primals		.12		.08		.35		.23		.19		.15
Abundant	.08		.04		.39*		.32*	−.06	.23*	−.09	.22*	
Acceptable	−.10		−.11		−.05		−.05	−.08	−.07		.01	
Beautiful	.20*		.14*		.44*		.36*		.35*		.29*	
Changing	.04		.09		.04		.05		.08		.08	
Cooperative	−.01		−.03		.21*		.26*		.18*	.15*	.19*	
Funny	.04	−.10	.08		.29*		.27*	.11	.30*	.15*	.23*	.12*
Harmless	.16*		.12*		.32*		.21*		.15*	−.07	.10	−.10
Hierarchical	.19*		.11		.07		.00		.03		.00	
Improvable	.22*		.16*		.30*		.20*	−.06	.20*		.17*	
Intentional	.15*		.15*		.26*	−.16*	.17*	−.11	.16*		.25*	
Interactive	.14*		.13*		.23*		.12*	−.07	.14*		.20*	
Interconnected	.06		.08		.19*		.19*	.09	.14*		.26*	
Interesting	.12*		.04		.32*		.29*		.22*		.24*	
Just	.20*		.22*	.06	.35*		.24*		.24*		.21*	
Meaningful	.17*		.14*		.36*		.32*		.24*		.27*	
Needs me	.21*		.13*		.41*	.18*	.28*	.12	.18*		.30*	
Pleasurable	.12*		.04		.42*		.39*	.11	.24*		.21*	
Progressing	.10		−.02		.29*		.21*		.10		.08	
Regenerative	.15*		.08		.41*		.29*		.22*		.22*	
Stable	.01		−.03		.16*		.13*	−.09	.00	−.12	.10	
Understandable	.19*		.13*		.29*		.17*		.20*		.16*	
Worth exploring	.15*		.15*		.32*		.22*	−.09	.26*		.17*	

Note. For every character strength, the first decimal per primal refers to the zero-order correlations and the second decimal per row refers to the zero-, first- and second-order models, respectively. Adjusted R^2 and standardized slopes are based on recursive feature elimination in 200 tenfold-cross-validation samples. Primals that were excluded by recursive feature elimination do not appear in the tables. P-values were adjusted across all correlation and regression tests (m = 2262) using Holm's correction. Significant slopes are marked with asterisks (*).

as suppressors, and *empowering* did not emerge as predictor. Including secondary primals allowed for additionally predicting judgment and led to small increases in adjusted R^2 (*Med* = .04). Notable exceptions were the following secondary primals, which yielded the numerically strongest increases: *alive* in spirituality (ΔR^2_{adj} = .18); *safe* in humor (ΔR^2_{adj} = .09); *enticing* and *fluid* in appreciation of beauty (ΔR^2_{adj} = .07); *fluid* in love of learning (ΔR^2_{adj} = .06); and *enticing* and *safe* in curiosity (ΔR^2_{adj} = .06). *Fluid* uniquely predicted judgment (ΔR^2_{adj} = .04).

Beyond the primary and secondary primals, the tertiary primals *beautiful, cooperative, funny, intentional, interesting, needs me, pleasurable*, and *worth exploring* emerged as mostly positive predictors of a few character strengths and the rest did not emerge as predictors. Including tertiary primals allowed for additionally predicting humility and prudence and led to marginal increases in adjusted R^2 (*Med* = .02). Notable exceptions were the following tertiary primals, which yielded the numerically strongest increases: *funny* and *pleasurable* in humor (ΔR^2_{adj} = .17); *beautiful* in appreciation of beauty (ΔR^2_{adj} = .09); *beautiful, intentional*, and *needs me* in spirituality (ΔR^2_{adj} = .07); *beautiful* in gratitude (ΔR^2_{adj} = .07); and *interesting, needs me*, and *worth exploring* in curiosity and love of learning (ΔR^2_{adj} = .06). *Abundant, funny*, and *needs me* were uniquely negative predictors of humility (ΔR^2_{adj} = .05) and prudence (ΔR^2_{adj} = .02).

Discussion

This study shows that a selection of primals relates strongly to a number of character strengths. The primary primal *good* often explained the largest share of variance, especially in hope, spirituality, zest, gratitude, curiosity, and leadership. Considering specific secondary and tertiary primals increased prediction power, but these increments were typically small compared to those contributed by the primary primal. Notable exceptions were the secondary primals *safe, enticing, alive*, and *fluid* in explaining curiosity, love of learning, appreciation of beauty, humor, and spirituality. Among tertiary primals, *beautiful, funny, intentional, interesting, needs me, pleasurable*, and *worth exploring* proved especially important in predicting curiosity, love of learning, appreciation of beauty, gratitude, humor, and spirituality. On

Table 3. Zero-order correlations and sequential linear models regressing primals on character strengths (part 3/4).

	Teamwork		Fairness		Leadership		Forgiveness		Humility		Prudence	
R^2_{adj} Primary primal		.11		.06		.19		.12		.00		.00
Good	.33*	.33*	.25*	.25*	.44*	.44*	.34*	.34*	−.02	−.02	.02	.02
R^2_{adj} Secondary primals		.13		.11		.21		.15		.01		.02
Safe	.30*	.05	.24*		.35*		.35*	.06	.01		.01	
Enticing	.34*	.15	.29*	.18*	.39*		.35*	.11	.03	.12	.00	
Alive	.23*	−.10	.13*	−.25*	.36*		.16*	−.25*	−.03	−.09	.05	
Empowering	.15*	.04	.16*	.09	.18*	.07	.09		.00		.14*	.12*
Communal	.17*	−.12	.22*	.10	.28*		.30*	.09	−.01		−.01	
Fluid	−.05	.07	.01	.17*	−.02	.09	−.12*	.08	.06	.10	.08	.07
R^2_{adj} Tertiary primals		.15		.15		.21		.17		.05		.03
Abundant	.21*	−.12	.18*	−.14	.26*		.27*		−.06	−.20*	−.01	
Acceptable	−.06		−.09	−.03	−.06		.01		−.01		−.10	
Beautiful	.30*		.26*	.06	.32*		.30*		.08	.11	.06	.09
Changing	.02	−.06	.06	−.08	.09		.04		.04		.04	
Cooperative	.16*		.18*	.07	.23*		.27*		.00		−.02	
Funny	.24*	.07	.20*	.08	.25*		.20*		−.02		−.08	−.14*
Harmless	.20*		.15*		.21*		.28*		.04	.07	.01	
Hierarchical	.04		−.13*	−.07	.00		−.14*		.01		.06	
Improvable	.20*		.18*	−.05	.25*		.17*		−.01		.12*	
Intentional	.14*	−.07	.03	−.13	.23*	−.05	.05	−.11	−.02		.01	
Interactive	.13*		.09	.10	.24*		.06		−.04		.07	
Interconnected	.15*	.08	.15*		.27*		.16*		.01		.04	
Interesting	.21*		.21*		.24*		.24*		.03		−.02	
Just	.25*	.10	.13*	.10	.26*		.20*	.11	.03	.10	.02	
Meaningful	.25*		.18*	.05	.31*		.19*		.04	.11	.03	
Needs me	.16*	−.05	.06	−.04	.32*		.12*		−.11	−.18*	.04	
Pleasurable	.28*	.10	.16*	−.04	.28*		.29*		−.03		−.05	
Progressing	.14*		.09	−.12	.18*		.20*	−.14	−.03		.01	
Regenerative	.23*		.17*		.28*		.31*	.09	.00		.01	
Stable	.05	−.11	.01	−.04	.12		.16*		−.09		−.07	
Understandable	.18*		.15*	.05	.24*		.19*		−.03		.03	
Worth exploring	.22*		.29*	.06	.29*		.23*		.04		.01	

Note. For every character strength, the first decimal per primal refers to the zero-order correlations and the second decimal per row refers to the zero-, first- and second-order models, respectively. Adjusted R^2 and standardized slopes are based on recursive feature elimination in 200 tenfold-cross-validation samples. Primals that were excluded by recursive feature elimination do not appear in the tables. P-values were adjusted across all correlation and regression tests (m = 2262) using Holm's correction. Significant slopes are marked with asterisks (*).

the other hand, *abundant, funny*, and *needs me* negatively predicted humility and prudence. In the remaining character strengths, including secondary primals typically yielded an increment of less than 50% of the explained variance contributed by the primary primal, and including tertiary primals yielded an increment of less than 25%.

The American English and German Primals Inventories comprise 99 and 66 items, respectively, and thus they may be too long to be included in certain scientific or practical contexts. But our results suggest that measuring the full catalog of primals is unnecessary when predicting character strengths–measuring the primary, secondary, and some selected tertiary primals should suffice. In particular, a good prediction should already be possible by measuring only the primary primal *good*, the secondary primals *safe, enticing, alive*, and *fluid*, and the tertiary primals *beautiful, funny, intentional, interesting, needs me, pleasurable*, and *worth exploring*. If measuring strengths-related primals is the only objective, we hence recommend using Clifton and Yaden's (2021) brief measure of primary and secondary primals–the PI-18–and including additional items for measuring some of the tertiary primals above as seen fit. For example, if researchers were interested in measuring humor-related primals, we would recommend administering the PI-18 together with 3–5 items for *funny* and *pleasurable*.

Implications for positive psychology interventions

Our study validates Clifton's (2020a) proposal that primals contribute to describing and predicting important personality differences, such as character strengths. If our results can be replicated and generalized, the next step would be testing whether primals also play an important role in personality development, as foretold by many contemporary theories (e.g., Dweck, 2017; Fleeson & Jayawickreme, 2015; Geukes et al., 2018). Clifton (2020a) explains that this requires experimental research, which may either investigate primals as *mediators* or as *targets* of dedicated interventions. First, future research may choose to investigate whether established interventions–such as Three Good Things, Counting Blessings, and Gratitude Visit–change personality and well-being through changing primals. This could involve administering such interventions and simply measuring the relevant primals identified in this study

Table 4. Zero-order correlations and sequential linear models regressing primals on character strengths (part 4/4).

	Self-regulation		Appreciation		Gratitude		Hope		Humor		Spirituality	
R^2_{adj} Primary primal		.06		.06		.22		.32		.09		.30
Good	.24*	.24*	.25*	.25*	.47*	.47*	.57*	.57*	.30*	.30*	.55*	.55*
R^2_{adj} Secondary primals		.08		.13		.27		.37		.18		.48
Safe	.23*	.15*	.17*		.34*	−.09	.51*	.12	.38*	.37*	.28*	−.14*
Enticing	.20*		.28*	.20*	.48*	.24*	.52*	.10	.27*		.34*	−.28*
Alive	.19*		.25*	−.10	.42*		.41*	−.05	.13*	−.13*	.68*	.47*
Empowering	.15*		.11		.15*		.23*	.06	.12		.06	−.06
Communal	.06	−.20*	.19*		.28*	−.10	.28*	−.23*	.09	−.26*	.35*	
Fluid	−.02		.16*	.29*	.02	.15*	−.16*		−.09	.08	.02	
R^2_{adj} Tertiary primals		.10		.23		.34		.41		.36		.55
Abundant	.13*		.20*	−.03	.35*		.39*	−.04	.23*	−.05	.22*	.07
Acceptable	−.05		−.05	−.05	−.04	−.06	−.05		−.03	−.02	.09	
Beautiful	.19*		.37*	.35*	.47*	.20*	.44*	−.05	.29*	−.03	.35*	.15*
Changing	.02		.16*	−.08	.17*		.03		.01	−.04	.10	
Cooperative	.04		.11	.15	.23*	.07	.24*	−.10	.12	.06	.26*	
Funny	.06	−.10	.22*	.09	.28*	.08	.28*		.57*	.41*	.15*	
Harmless	.20*		.02	−.10	.15*	−.10	.33*	−.09	.18*	−.19*	.16*	
Hierarchical	.14*		−.07	−.02	−.02		.09		.10	−.02	.01	
Improvable	.20*		.14*	−.03	.22*	−.07	.35*		.17*	−.05	.21*	
Intentional	.14*		.19*	.01	.33*		.28*	−.12	.06	−.06	.67*	.20*
Interactive	.09		.17*	.04	.24*	−.07	.22*	−.09	.08	−.02	.46*	−.17*
Interconnected	.10	.05	.27*	−.01	.29*		.21*	.09	.04	.04	.44*	−.10
Interesting	.15*	.07	.21*	.03	.37*	.10	.30*		.12	−.03	.20*	.04
Just	.19*		.13*	−.08	.32*		.38*	.04	.19*	.07	.42*	−.14*
Meaningful	.15*		.19*	−.13	.35*	−.17*	.36*	−.07	.10	−.07	.41*	−.11
Needs me	.19*		.18*	.05	.38*	.10	.42*	.17*	.14*	.07	.67*	.18*
Pleasurable	.14*		.07	−.10	.30*		.49*	.19*	.26*	.16*	.19*	−.05
Progressing	.14*		.00	−.10	.14*		.33*	.06	.15*	−.06	.15*	.05
Regenerative	.19*		.11	−.04	.28*		.46*	.05	.24*	−.07	.25*	−.07
Stable	.08		−.09	−.05	.01	−.12*	.21*	−.05	.08	−.03	.11	−.08
Understandable	.19*		.03	−.06	.15*		.33*		.19*	−.08	.15*	
Worth exploring	.10		.22*	−.07	.25*	−.14*	.27*	−.05	.21*	.01	.07	−.07

Note. For every character strength, the first decimal per primal refers to the zero-order correlations and the second decimal per row refers to the zero-, first- and second-order models, respectively. Adjusted R^2 and standardized slopes are based on recursive feature elimination in 200 tenfold-cross-validation samples. Primals that were excluded by recursive feature elimination do not appear in the tables. P-values were adjusted across all correlation and regression tests (m = 2262) using Holm's correction. Significant slopes are marked with asterisks (*). Appreciation = Appreciation of beauty and excellence.

before and afterward. For example, if becoming more grateful was mediated by seeing the world as a more *good, enticing, fluid*, and *beautiful* place, we could infer that these primals indeed drive this development.

Second, future research may choose to develop new interventions that directly target the primals found most important in predicting specific character strengths. This could involve developing interventions that either attempt changing primals to change behaviors ('top-down') or training specific behaviors to change primals by extension ('bottom-up'; see Dweck, 2017). Indeed, there already exists a small literature that proves top-down interventions' success in changing personality, such as by teaching what Dweck (2017) calls 'growth mindsets' about personality and intelligence (e.g., Miu & Yeager, 2015; Yeager et al., 2013). Similarly, Clifton (2020a) proposed that primals can be changed through deliberate experiences or targeted education. Again, if partaking in some combination of these interventions would elicit changes in character strengths, we could infer that this primal–or at least its superordinate secondary and primary primals–drive this development.

Some testable hypotheses for future intervention studies

What couplings of primals and character strengths offer the most promise for such interventions, based on theory and our new findings? We provided detailed descriptions of our results so that researchers can make those determinations themselves, but we can also point at three cases that we deem especially important for future research.

First, we found that believing in a *good* world explained 32% of variance in hope, and thus strengthening this belief might strengthen hope by extension (see also, Clifton, 2020a). Hope is important because it typically contributes the most to explaining well-being and flourishing (e.g., Harzer, 2016; Park et al., 2004). According to Peterson and Seligman (2004), hope entails a cognitive, emotional, and motivational stance toward the future: believing that desired outcomes will occur, feeling confident and cheerful toward them, and acting in ways expected to make them more likely (see also, Alarcon et al., 2013; Krafft et al., 2021). Hope's cognitive stance blends two key qualities of believing in a *good* world: that the world *can* offer such desired outcomes

(e.g., that it is *beautiful, pleasurable, abundant*) and that it *will* offer them also in the future. It may be this expected universality across time and space that accounts for *good* explaining more variance in hope than in any other character strength. If this were true, hopeful people should be distinguishable by the generality of their beliefs: those who believe that (most) every time and place are *good* should be more hopeful than those who have doubts about the future or other nations. Put simply, the more 'primal' their positive beliefs, the more hopeful people should be. Accordingly, strengthening hope may not be so much about telling people that the world can offer some goodness–most will agree that they can find beauty or pleasure in specific times or places–but about convincing them in the ubiquity of goodness, wherever they are. As such, a promising pathway toward strengthening hope may involve working with individuals' implicit beliefs about goodness that are confined to treasured places and memories–and then gradually evolving them toward becoming primals.

Second, we found that believing in an *enticing, interesting* world that is *worth exploring* explained 32% of variance in curiosity and 22% of variance in love of learning. Accordingly, strengthening these beliefs might strengthen them by extension (see, also Clifton, 2020a). Curiosity and love of learning are important especially for children, adolescents, and young adults because they correlate strongly with positive emotions, satisfaction, and achievement in school (e.g., Lounsbury et al., 2009; Weber et al., 2016). While individual motifs can differ, both character strengths involve an intrinsic interest in the world that fuels exploration, study, and inquiry (Peterson & Seligman, 2004). Indeed, we can easily identify primals-related items in the VIA-IS, such as in curiosity's 'I think my life is extremely interesting'. In other words, primals have already been acknowledged as conceptual parts of curiosity and love of learning, but only now can we distinguish them as unique objects of study. Hence, if we were successful in convincing people that the world is an *enticing, interesting* place that is *worth exploring*, more curiosity and love of learning should follow suit.

Third, we found that believing in a safe, pleasurable, and especially *funny* world explained 36% of variance in humor, and thus strengthening specifically the latter belief might strengthen humor by extension. Contrary to what intuition may suggest, humor is not only about cracking jokes and appreciating comic strips: many people eventually arrive at the conclusion that the world and humanity are ultimately flawed, but while fatalists surrender to dread or cynicism, humorists can sustain a benevolent, amused perspective that transforms fear into laughter and sarcasm into witty satire (see, also Müller & Ruch, 2011; Ruch & Heintz, 2016). One of the most successful interventions to fostering humor is McGhee's (2010), 7 Humor Habits Program, which attempts to make people gradually assume a more playful attitude throughout their daily lives. This approach bears striking similarities to what Dweck (2017) identified as a bottom-up approach to intervention: practicing specific behaviors (e.g., laughing more often and heartedly; taking yourself lightly, laughing at yourself) to change beliefs by extension. Hence, our new understanding of primals allows us to reframe McGhee's (2010) program as an intervention to foster believing in a *funny* world. If this were true, partaking in the program should account for changes in this primal that ultimately explain changes in humor–*funny* would be a mediator of the program's success and thus constitute a cause of humor.

Limitations

This study's results and inferences are subject to a number of limitations that primarily pertain to our sample, our analytical strategy, and the assumed malleability of primals. First, our results are based on the self-reports of a German-speaking convenience sample that self-selected to complete the PI-66-G and the VIA-IS, and hence they have limited generalizability. Only a third of participants identified as men and only about a quarter were Swiss and Austrian citizens. Our results should reflect commonalities in the correlations across gender and nationality, but it is unclear whether they also could be replicated in culturally more homogeneous samples. Clifton et al. (2019) and Peterson and Park et al.'s (2004) catalogs were designed to reflect universals, and thus we can assume that the *conceptual* connection of primals and characters strengths is universal, as well. However, the literature also notes some cultural variations–for example, Stahlmann et al. (2020) reported that–while the PI-66-G's higher-order structure largely corresponded to that reported by Clifton et al. (2019)–there were slight differences in the number and contents of the secondary primals. Accordingly, we hope that future research will reanalyze and replicate the relationships of primals and character strengths in other, culturally more homogeneous samples.

Second, our analytical strategy built on sequentially partialling out variance in character strengths, and it is unclear to what extend secondary and tertiary primals still predicted systematic residuals–instead of unsystematic errors due to unreliability. Overall, the similarities in the patterns of sequential and zero-order models suggest that the residuals contained enough systematic variance to be included as criteria in the first-

and second-order analyses. However, we cannot determine how much of the differences between sequential and zero-order models can be attributed to the partialling out of higher-order primals and how much to an inevitable loss of power. As such, we may have missed small but noteworthy effects of specific primals–especially of tertiary primals, which were the last to be included in the models. We may obtain more power by attempting to measure such primals without simultaneously measuring their higher-order counterparts–for example, by attempting to measure the unique variance in *needs me* without measuring its covariance with other primals that make up *alive* and *good*. However, we are unsure whether this would be possible at all, and as such, we conclude that our analytical strategy currently offers the best perspective on primals' unique contributions to explaining character strengths–notwithstanding its shortcomings in power.

Third, there is, to date, only sparse evidence that supports the idea that primals can be changed (Clifton, 2020b). Primals may be rather stable lenses through which individuals interpret the world and thus hardly malleable by new experiences. For example, one may expect that high income relates to seeing the world as a more abundant place, but this has not been substantiated by empirical data (Clifton, 2020b). On the other hand, we can already look back on literature that documents changes in beliefs that we may now label as primals, such as the findings discussed by Beck (e.g., Beck & Alford, 2009; Beck, 1967) and Dweck (2017). As such, and until proven otherwise, we echo Clifton's (2020b, p. 8) optimism in saying that 'even if experiences that influence primals cannot be found, perhaps they can be designed.'

Conclusion

This study has shown that believing in a *good* world explains a large portion of variance in a number of character strengths, especially in hope, spirituality, zest, gratitude, curiosity, and leadership. Beyond this general effect, a selection of secondary and tertiary primals emerged as important predictors for specific character strengths, such as *enticing* for curiosity and *funny* for humor. We have reason to assume that, in some of these couplings, primals can affect whether or not the character strengths develop. As such, we recommend including them in positive psychology interventions and testing whether changing these primals elicits changes in character strengths by extension.

Acknowledgments

We are grateful to Dr. Jeremy Clifton, Dr. Fabian Gander, Dr. Martin Seligman, and Melanie Stahlmann for proffering helpful comments on earlier versions of this article.

Disclosure statement

In accordance with Taylor & Francis policy and our ethical obligation as researchers, we are reporting that Willibald Ruch is a Senior Scientist for the VIA Institute on Character, which holds the copyright to the VIA Inventory of Strengths. The remaining author declares that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

ORCID

Willibald Ruch http://orcid.org/0000-0001-5368-3616

Data availability statement

Please contact the first author if you are interested in working with the data reported in this manuscript. The data described in this article are openly available in the open science Framework at https://doi.org/10.17605/OSF.IO/F573G

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/10.17605/OSF.IO/F573G

References

Alarcon, G. M., Bowling, N. A., & Khazon, S. (2013). Great expectations: a meta-analytic examination of optimism and hope. *Personality and individual differences*, *54*(7), 821–827. https://doi.org/10.1016/j.paid.2012.12.004

Beck, A. T. (1967). *Depression. causes and treatment* (1st ed.). University of Pennsylvania Press.

Beck, A. T., & Alford, B. A. (2009). *Depression. causes and treatment* (2nd ed.). University of Pennsylvania Press.

Clifton, J. D. W. (2020a). Happy in a crummy world: implications of primal world beliefs for increasing wellbeing through positive psychology interventions. *The Journal of Positive Psychology*, *15*(5), 691–695. https://doi.org/10.1080/17439760.2020.1789703

Clifton, J. D. W. (2020b). Testing if primal world beliefs reflect experiences—or at least some experiences identified ad hoc. *Frontiers in Psychology*, *11*, 1145. https://doi.org/10.3389/fpsyg.2020.01145

Clifton, J. D. W. (2022). Measuring primal world beliefs. In W. Ruch, A. Bakker, L. Tay, & F. Gander, (Eds.), *Handbook of positive psychology assessment*. European Association of Psychological Assessment.

Clifton, J. D. W., Baker, J. D., Park, C. L., Yaden, D. B., Clifton, A. B. W., Terni, P., Seligman, M. E. P., Zeng, G., Giorgi, S., Schwartz, H. A., & Seligman, M. E. P. (2019). Primal world beliefs. *Psychological Assessment*, *31*(1), 82–99. https://doi.org/10.1037/pas0000639

Clifton, J. D. W., & Yaden, D. B. (2021). Brief measures of the four highest-order primal world beliefs. *Psychological Assessment*, *33*(12), 1267–1273. http://dx.doi.org/10.1037/pas0001055

Dweck, C. S. (2017). From needs to goals and representations: foundations for a unified theory of motivation, personality, and development. *Psychological Review*, *124*(6), 689–719. http://dx.doi.org/10.1037/rev0000082

Eysenck, H. J., & Eysenck, M. W. (1985). *Personality and individual differences: A natural science approach*. Plenum.

Fleeson, W., & Jayawickreme, E. (2015). Whole trait theory. *Journal of Research in Personality*, *56*, 82–92. https://doi.org/10.1016/j.jrp.2014.10.009

Geukes, K., van Zalk, M., & Back, M. D. (2018). Understanding personality development: an integrative state process model. *International Journal of Behavioral Development*, *42* (1), 43–51. https://doi.org/10.1177/0165025416677847

Harzer, C. (2016). The eudaimonics of human strengths: the relations between character strengths and well-being. In J. Vittersø (Ed.), *Handbook of eudaimonic well-being* (pp. 307–322). Springer. https://doi.org/10.1007/978-3-319-42445-3_20

Koltko-Rivera, M. E. (2004). The psychology of worldviews. *Review of General Psychology*, *8*(1), 3–58. https://doi.org/10.1037/1089-2680.8.1.3

Krafft, A. M., Guse, T., & Maree, D. (2021). Distinguishing perceived hope and dispositional optimism: theoretical foundations and empirical findings beyond future expectancies and cognition. *Journal of Well-Being Assessment*, *4*, 217–243. https://doi.org/10.1007/s41543-020-00030-4

Kuhn, M. (2021). *caret: Classification and regression training (R package version 6.0-88)*. https://cran.r-project.org/package=caret

Lancaster, B. P. (1999). Defining and interpreting suppressor effects: advantages and limitations. In B. Thompson (Ed.), *Advances in social science methodology* (Vol. 5, pp. 139–148). JAI Press.

Lounsbury, J. W., Fisher, L. A., Levy, J. J., & Welsh, D. P. (2009). An investigation of character strengths in relation to the academic success of college students. *Individual Differences Research*, *7*(1), 52–69.

McCrae, R. R., & Costa, P. T. (1999). The five-factor theory of personality. In O. P. John (Ed.), *Handbook of personality theory and research* (pp. 139–153). Guilford Press.

McGhee, P. E. (2010). *Humor as survival training for a stressed-out world: The 7 humor habits program*. AuthorHouse.

Miu, A. S., & Yeager, D. S. (2015). Preventing symptoms of depression by teaching adolescents that people can change: effects of a brief incremental theory of personality intervention at 9-month follow-up. *Clinical Psychological Science*, *3*(5), 726–743. https://doi.org/10.1177/2167702614548317

Müller, L., & Ruch, W. (2011). Humor and strengths of character. *The Journal of Positive Psychology*, *6*(5), 368–376. https://doi.org/10.1080/17439760.2011.592508

Park, N., Peterson, C., & Seligman, M. E. P. (2004). Strengths of character and well-being. *Journal of Social and Clinical Psychology*, *23*(5), 603–619. https://doi.org/10.1521/jscp.23.5.603.50748

Peterson, C., & Seligman, M. E. P. (2004). *Character strengths and virtues: A handbook and classification*. Oxford University Press; American Psychological Association.

R Core Team. (2021). *R: A language and environment for statistical computing (version 4.0.5)*. https://www.R-project.org/

Revelle, W. (2021). *psych: procedures for psychological, psychometric, and personality research (R package version 2.1.3)*. https://CRAN.R-project.org/package=psych

Ruch, W., & Heintz, S. (2016). The virtue gap in humor: exploring benevolent and corrective humor. *Translational Issues in Psychological Science*, *2*(1), 35–45. https://doi.org/10.1037/tps0000063

Ruch, W., Proyer, R. T., Harzer, C., Park, N., Peterson, C., & Seligman, M. E. P. (2010). Values in action inventory of strengths (VIA-IS): adaptation and validation of the German version and the development of a peer-rating form. *Journal of Individual Differences*, *31*(3), 138–149. https://doi.org/10.1027/1614-0001/a000022

Stahlmann, A. G., Hofmann, J., Ruch, W., Heintz, S., & Clifton, J. D. W. (2020). The higher-order structure of primal world beliefs in German-speaking countries: adaptation and initial validation of the German primals inventory (PI-66-G). *Personality and Individual Differences*, *163*, 110054. https://doi.org/10.1016/j.paid.2020.110054

Tzelgov, J., & Henik, A. (1991). Suppression situations in psychological research: Definitions, implications, and applications. *Psychological Bulletin*, *109*(3), 524–536. https://doi.org/10.1037/0033-2909.109.3.524

Vazquez, C., Valiente, C., García, F. E., Contreras, A., Peinado, V., Trucharte, A., & Bentall, R. P. (2021). Post-traumatic growth and stress-related responses during the COVID-19 pandemic in a national representative sample: the role of positive core beliefs about the world and others. *Journal of Happiness Studies*, *22*(7), 2915–2935. https://doi.org/10.1007/s10902-020-00352-3

Weber, M., Wagner, L., & Ruch, W. (2016). Positive feelings at school: on the relationships between students' character strengths, school-related affect, and school functioning. *Journal of Happiness Studies*, *17*(1), 341–355. https://doi.org/10.1007/s10902-014-9597-1

Yeager, D. S., Trzesniewski, K. H., & Dweck, C. S. (2013). An implicit theories of personality intervention reduces adolescent aggression in response to victimization and exclusion. *Child Development*, *84*(3), 970–988. https://doi.org/10.1111/cdev.12003.