ORIGINAL MANUSCRIPT

The association between Extraversion and well-being is limited to one facet

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Funding information
John Templeton Foundation, Grant/Award Number: #57313

Abstract

Objective: Mõttus argues that effects should not be attributed to traits if they are driven by particular facets or items. We apply this reasoning to investigate the relationship between facets and items of Extraversion and well-being.

Method: We analyzed five cross-sectional datasets (total $N = 1,879$), with facet- and item-level correlations and *SEM*.

Results: We found that the correlation between the energy level facet and well-being was solely responsible for the association between Extraversion and well-being. Neither sociability nor assertiveness were uniquely related to well-being when energy level was included as a predictor. Thus, the correlations between well-being and sociability and between well-being and assertiveness can be almost fully explained by these constructs' relationships with energy level.

Conclusions: We conclude that the link between Extraversion and well-being should be attributed to the energy level facet rather than generalized to the trait level.

KEYWORDS
energy level, Extraversion, facets, positive affect, well-being

1 | INTRODUCTION

The association between Extraversion and positive affect has practically become conventional wisdom in personality psychology. However, Mõttus (2016) points out that many effects attributed to global traits (like Extraversion) may be more accurately attributed to facets or items. The current study examines the relationship between Extraversion and positive affect, as well as other indicators of well-being, by exploring facet-level and item-level associations.

1.1 | Extraversion and well-being

Costa and McCrae (1980) theorized about Extraversion's relationship to positive affect, asserting that Extraversion correlates more strongly with positive affect than with negative affect. Correlational studies support this hypothesis; a meta-analysis found that, on average, Extraversion (as assessed by the NEO personality inventory; Costa & McCrae, 1992) is correlated with positive affect at $r = .44$ and with negative affect at $r = -.18$ (Steel, Schmidt, & Shultz, 2008). Other components of well-being were also found to be associated with Extraversion—$r = .28$ for life satisfaction and $r = .49$ for happiness.

The link between Extraversion and positive affect is so well studied that there is even experimental evidence, a rarity in personality research. A series of studies demonstrated that individuals randomly assigned to act extraverted during a 10–20-min laboratory social interaction report more positive affect than when assigned to act introverted (Fleeson, Malanos, & Achille, 2002; McNiel & Fleeson, 2006; McNiel, Lowman, & Fleeson, 2010; Zelenski et al., 2013; Zelenski, Santoro, & Whelan, 2012). More recent studies have shown that Extraversion interventions can produce longer lasting effects on well-being (Jacques-Hamilton, Sun, & Smillie, 2018; Margolis & Lyubomirsky, 2019).

1.2 | The need for facet- and item-level analyses

Before drawing causal conclusions from these experimental studies of the effects of Extraversion on positive affect, Mõttus (2016) points out that an additional type of evidence is needed. That is, if a trait exerts a causal force on an outcome, facets and items should be correlated with the outcome to the extent that they load onto the trait factor. In most cases, factor loadings are approximately equal across facets or items. Thus, under most conditions, Mõttus's requirement demands that correlations with the outcomes are approximately equal across facets or items in order to ascribe causality at the trait level.

Mõttus (2016) argues that when one finds an association between a trait and an outcome, one should test whether that association is equally strong across facets and across items. If the observed effect is due to a specific facet or set of items, researchers should conclude that the facet or set of items, not the trait, are associated with the outcome. The current study applies this approach to the association between Extraversion and well-being. Is the relation of Extraversion to well-being attributable to the general trait? Or are particular facets or items on an Extraversion measure associated with well-being to a greater extent than others?

Soto and John (2017) recently developed and validated the next-generation version of the Big Five Inventory (BFI-2). Unlike the original BFI, the BFI-2 was designed to feature a well-defined facet structure. Little research has examined the facet structure of the Big Five, and with no consensus emerging yet, Soto and John had great flexibility in choosing facets. From their review of the literature, they selected the following three facets for Extraversion: sociability, assertiveness, and energy level. The sociability and assertiveness facets are rather straightforward. These two facets seem to be two of the most internally consistent of the measure's 15 facets (Soto & John, 2017). However, the energy level facet is relatively less internally consistent due to its wider scope. The energy level facet includes items that reflect general energy ("is full of energy" and "is less active than other people"), as well as feelings relating to positive anticipation ("shows a lot of enthusiasm" and "rarely feels excited or eager").

1.3 | Current studies

We analyzed data from five datasets (total $N = 1,879$). Previous studies examining the relationship between Extraversion facets and well-being have used the NEO-PI-R (Costa & McCrae, 1992), as well as the IPIP measure based on it (Goldberg et al., 2006). Unsurprisingly, these studies found that the positive emotion facets correlated best with well-being (Marrero Quevedo & Carballeira Abella, 2011; Schimmack, Oishi, Furr, & Funder, 2004).

Warmth/friendliness, gregariousness, and assertiveness were also consistently correlated with well-being, whereas activity level and excitement-seeking were inconsistently correlated with well-being. No studies to our knowledge have assessed the relationships between positive affect and the BFI-2 facets of Extraversion. We examined the effects of the three Extraversion facets—as well as the specific items tapping Extraversion—on negative affect, happiness, and life satisfaction, in addition to positive affect, because Extraversion is related to each of these aspects of well-being (Steel et al., 2008).

2 | METHOD

2.1 | Participants

Study 1 ($N = 147$) and Study 2 ($N = 295$) included undergraduate students from a medium-sized public university. The Study 1 participants were mostly Asian (44%) or Latino (35%) and female (70%). The Study 2 participants were also mostly Asian (52%) or Latino (31%) and female (73%). In both studies, participants were 19 years old on average.

In Studies 3, 4, and 5, participants (Ns = 630, 504, and 303, respectively) were recruited with Prolific Academic™, a UK-based service similar to Amazon's mTurk™ specifically designed to connect online participants with researchers. Participants were mostly Caucasian (86%, 81%, and 73%, respectively) and about half were female (64%, 51%, and 51%, respectively). On average, the participants were in their 30s (M_{age} = 37, 35, and 32, respectively), with substantial variability (SD_{age} = 12 in each study).

Each study was developed for unrelated research questions, and sample sizes were determined by what was appropriate for those research questions. Our total sample size ($N = 1,879$) provided 99% power to detect an effect of $r = .1$. Participants were only excluded if they did not complete both our well-being and personality measures.

2.2 | Procedure

All questionnaires were completed online. Studies 1 and 2 were longitudinal experimental studies. For these studies, we analyzed data from an initial set of questionnaires administered before the experimental manipulation. Studies 3–5 were single time point correlational studies. In each study, additional measures were completed by participants and analyzed for different purposes. Other measures of well-being were also administered in Studies 4 and 5, but these measures were not analyzed for this project to keep our measures relatively consistent across studies. The measures used for this project are described below.

2.3 | Materials

2.3.1 | Positive and negative affect

Participants completed the Affect-Adjective Scale (i.e., Brief Emotion Report; Diener & Emmons, 1984), which asks respondents to rate the extent to which they have felt specific emotions (e.g., "joyful" and "depressed/blue"). We added three low-arousal items ("peaceful/serene," "dull/bored," and "relaxed/calm") to the original nine-item scale to ensure an equal number of high- and low-arousal emotions. In Studies 1, 2, and 4, participants were asked about their emotions over the past week. In Study 3, participants were asked about their emotions over the past 5 months and, in Study 5, participants were asked about their emotions in general. Across studies, McDonald's ω_ts, which estimate internal consistency reliability by calculating the proportion of variance in a scale total score attributable to one latent variable or common variance, ranged from .89 to .93 for positive affect and from .82 to .90 for negative affect.

2.3.2 | Life satisfaction

In all five studies, participants completed the five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985). They rated their agreement with items that indicate high life satisfaction (e.g., "In most ways my life is close to my ideal" and "I am satisfied with my life"). McDonald's ω_ts ranged from .86 to .92 across studies.

2.3.3 | Happiness

In Studies 1, 4, and 5, we administered the four-item Subjective Happiness Scale (Lyubomirsky & Lepper, 1999). This measure does not provide a specific definition of happiness, allowing participants to rate their happiness according to their own conception (e.g., "Compared with most of my peers, I consider myself" rated from "less happy" to "more happy"). Across the three studies, McDonald's ω_ts ranged from .87 to .90.

2.3.4 | Extraversion facets

We administered the Big Five Inventory–2 (i.e., BFI-2; Soto & John, 2017), which measures Extraversion with three four-item facets—sociability, assertiveness, and energy level. Items included "is talkative" (sociability), "has an assertive personality" (assertiveness), and "is full of energy" (energy level). The full inventory was given in all studies except Study 3, which only included Extraversion items. McDonald's ω_ts for Extraversion ranged from .84 to .88. McDonald's ω_ts across studies ranged from .83 to .87 for sociability, from .74 to .81 for assertiveness, and from .65 to .77 for energy level.

TABLE 1 Meta-analytic correlation matrix

	Positive affect	Negative affect	Happiness	Life satisfaction	Extraversion	Sociability	Assertiveness	Energy level
Positive affect		−.61 [−.64, −.58]	.78 [.75, .80]	.70 [.68, .72]	.48 [.44, .51]	.32 [.28, .36]	.25 [.21, .29]	.58 [.55, .61]
Negative affect	−.55 [−.58, −.51]		−.67 [−.71, −.64]	−.57 [−.60, −.54]	−.35 [−.39, −.31]	−.23 [−.28, −.19]	−.18 [−.22, −.14]	−.43 [−.46, −.39]
Happiness	.71 [.67, .74]	−.60 [−.64, −.55]		.73 [.70, .76]	.67 [.63, .70]	.47 [.41, .51]	.37 [.31, .42]	.75 [.72, .78]
Life satisfaction	.64 [.61, .66]	−.50 [−.54, −.47]	.66 [.62, .69]		.44 [.40, .47]	.28 [.24, .32]	.26 [.21, .30]	.52 [.49, .56]
Extraversion	.39 [.35, .43]	−.28 [−.32, −.24]	.54 [.49, .58]	.36 [.32, .40]		.87 [.86, .88]	.72 [.69, .74]	.66 [.63, .68]
Sociability	.29 [.24, .33]	−.20 [−.24, −.16]	.41 [.35, .46]	.25 [.20, .29]	.81 [.80, .83]		.59 [.55, .61]	.52 [.49, .55]
Assertiveness	.22 [.17, .26]	−.15 [−.20, −.11]	.31 [.25, .37]	.22 [.17, .26]	.76 [.74, .78]	.51 [.48, .54]		.40 [.36, .43]
Energy level	.48 [.44, .51]	−.34 [−.38, −.3]	.61 [.56, .64]	.43 [.39, .46]	.76 [.74, .78]	.52 [.49, .55]	.40 [.36, .43]	

Note: Confidence intervals (95%) are in brackets. Attenuated correlations are located on the lower left of the diagonal and disattenuated correlations are located on the upper right of the diagonal. Correlations were disattenuated with ωt.

2.3.5 | Analytic approach

First, we created a correlation matrix of Extraversion and well-being variables and compared how well each facet correlated with each type of well-being. We then predicted each well-being measure from the Extraversion facets using *SEM* (i.e., with each measure represented by a latent variable). To investigate whether our results at the facet level were driven by individual items, we correlated energy-level items to well-being measures and compared how well each item correlated with each type of well-being. These analyses were then repeated, but with well-being items and the energy-level facet.

Each of these analyses was meta-analyzed across our five studies. Correlations were fisher Z-transformed and weighted by the inverse of their variances. Standardized regression coefficients were meta-analyzed by pooling covariances of the items into a meta-analytic covariance matrix and applying *SEM* to that matrix.

Missing data, as a result of skipped questions, occurred at a rate below 0.2% in each sample. Because the missing data

rate was so low, we decided to use regression imputation to equate sample size across analyses, simplifying our analyses and their interpretation.

We compared our correlations with the Williams' test (Williams, 1959). To compare regression coefficients, we constrained them to be equal and tested how much worse the constrained model fit compared to the unconstrained model. For more information on our analyses, please see the questionnaires, data, and R code on this project's OSF page (https://osf.io/q4kt8/?view_only=2d2031234adf4b2e8e83aa696731ad2b).

3 | RESULTS

3.1 | Correlation matrix

The meta-analytic correlation matrix is presented in Table 1. The well-being measures were highly correlated with each other, as were the Extraversion facets. With both attenuated

TABLE 2 Well-being predicted by facets of Extraversion using *SEM*

Study	Sociability β	Assertiveness β	Energy level β	χ^2	DF	CFI	RMSEA	SRMR
Positive affect								
1	−.35 [−.66, −.03]	−.06 [−.29, .16]	.71 [.41, 1.00]	255.0	129	.89	.08	.07
2	−.37 [−.79, .05]	.04 [−.17, .25]	.69 [.35, 1.03]	373.2	129	.90	.08	.07
3	−.01 [−.16, .14]	−.05 [−.18, .09]	.66 [.55, .76]	711.1	129	.91	.08	.05
4	−.14 [−.30, .02]	.06 [−.09, .20]	.73 [.63, .83]	417.8	129	.94	.07	.05
5	.11 [−.06, .29]	−.10 [−.25, .05]	.60 [.45, .74]	45.6	129	.90	.09	.06
Meta	−.10 [−.18, −.01]	−.01 [−.08, .06]	.66 [.60, .73]	1,328.7	129	.93	.07	.04
Negative affect								
1	.33 [.00, .65]	.28 [.05, .50]	−.57 [−.89, −.26]	319.8	129	.82	.10	.09
2	−.43 [−.84, −.03]	.22 [.01, .44]	.16 [−.17, .50]	444.2	129	.85	.09	.09
3	−.06 [−.23, .10]	.12 [−.03, .27]	−.49 [−.61, −.37]	58.7	129	.92	.07	.05
4	.17 [.00, .35]	−.06 [−.22, .10]	−.56 [−.68, −.45]	414.7	129	.93	.07	.05
5	−.13 [−.31, .06]	−.02 [−.18, .15]	−.37 [−.53, −.21]	494.8	129	.87	.10	.07
Meta	.02 [−.08, .11]	.04 [−.03, .12]	−.44 [−.52, −.37]	1,570	129	.90	.08	.05
Happiness								
1	−.26 [−.56, .05]	.09 [−.12, .30]	.85 [.58, 1.12]	187.6	98	.91	.08	.07
4	.00 [−.16, .15]	.01 [−.13, .15]	.74 [.64, .83]	326.2	98	.94	.07	.05
5	.20 [.04, .36]	−.13 [−.27, .01]	.66 [.53, .79]	317.4	98	.92	.09	.07
Meta	.05 [−.05, .15]	−.03 [−.12, .06]	.72 [.65, .79]	575.7	98	.94	.07	.05
Life satisfaction								
1	−.55 [−.88, −.21]	−.03 [−.26, .20]	.82 [.51, 1.13]	233.5	113	.88	.09	.08
2	−.30 [−.71, .12]	.09 [−.12, .29]	.62 [.29, .96]	334.6	113	.90	.08	.06
3	−.12 [−.28, .04]	.06 [−.09, .20]	.55 [.44, .67]	38.2	113	.95	.06	.04
4	−.17 [−.34, −.01]	.08 [−.07, .23]	.64 [.53, .75]	322.6	113	.95	.06	.05
5	.16 [−.03, .34]	−.04 [−.21, .12]	.43 [.27, .59]	316.4	113	.92	.08	.06
Meta	−.12 [−.21, −.04]	.04 [−.03, .12]	.58 [.51, .64]	1,025.2	113	.94	.07	.04

Note: DF = Degrees of Freedom. CFI = Comparative Fit Index. RMSEA = Root Mean Square Error of Approximation. SRMR = Standardized Root Mean Square Residual. Meta = Meta-analysis of above studies.

and disattenuated correlations, and across well-being measures, energy level was a stronger predictor of well-being than sociability and assertiveness. For each well-being measure, we compared how strongly the well-being measure was correlated with energy level versus the measure's association with each of the other facets. All p values were significant (highest $p = 5.94 \times 10^{-28}$). Notably, the energy-level facet was correlated with well-being measures to a greater extent than the overall Extraversion trait. Thus, energy level may have been responsible for the overall correlations between Extraversion and well-being; this possibility was explored further with *SEM*.

3.2 | SEM

For each well-being outcome, we also created an *SEM* in which each Extraversion facet predicted the well-being outcome. As shown in Table 2, across well-being outcomes, meta-analytic coefficients for energy level were substantially larger than those for sociability and assertiveness. Indeed, sociability and assertiveness were often associated with lower well-being. For each well-being measure, we compared how strongly the well-being measure was predicted by energy level versus each of the other facets. All p values were significant (highest $p = 3.41 \times 10{-13}$).

3.3 | Item-level analyses

Were certain energy-level items responsible for the effects of the energy-level facet on well-being? Meta-analytic correlations between energy-level items and well-being measures are reported in Table 3. Across energy-level items, correlations between these items and well-being items were relatively stable, indicating that our effects were not driven by particular energy-level items. However, one energy-level item ("is less active than other people") was less predictive of well-being items than the other energy-level items ("rarely feels excited or eager," "is full of energy," and "shows a lot of enthusiasm").

Were particular well-being items responsible for the effects of energy level on well-being? Correlations between energy-level and well-being items were relatively consistent within each measure (see Table 4), suggesting that our effects were not driven by particular well-being items. Although many items had significantly different correlations with energy level, these differences were small in magnitude.

4 | DISCUSSION

In line with Mõttus's (2016) recommendations, across five studies, we analyzed the relations of aspects of well-being to facets and items of Extraversion. Our results indicate that items and facets were not associated with well-being

TABLE 3 Correlations between energy-level items and well-being measures and p values testing differences between correlations

Energy-level item	r [95% CI]	1	2	3
Positive affect				
1	.36 [.32, .40]			
2	.23 [.19, .28]	<.001		
3	.41 [.38, .45]	.02	<.001	
4	.41 [.37, .45]	.02	<.001	.89
Negative affect				
1	−.26 [−.30, −.22]			
2	−.25 [−.29, −.21]	.67		
3	−.27 [−.31, −.22]	.89	.51	
4	−.23 [−.27, −.19]	.17	.44	.09
Happiness				
1	.46 [.41, .51]			
2	.33 [.28, .39]	<.001		
3	.51 [.46, .55]	.03	<.001	
4	.48 [.43, .53]	.24	<.001	.18
Life satisfaction				
1	.31 [.27, .35]			
2	.24 [.20, .29]	.01		
3	.36 [.32, .40]	.06	<.001	
4	.35 [.31, .38]	.16	<.001	.49

uniformly, with the energy-level facet correlated with well-being to a greater extent than were sociability or assertiveness. Furthermore, when well-being outcomes were predicted by all three facets, energy level had strong effects on well-being outcomes, while the other facets had near-zero effects. The low regression coefficients for sociability and assertiveness suggest that sociability and assertiveness were associated with well-being because of their associations with energy level. Taken together, our results suggest that the energy-level facet of the BFI-2 almost fully accounts for the relationship between trait Extraversion and well-being. This finding is particularly notable in light of Soto and John's (2017) suggestion that some facets are likely to be more central to Extraversion (and other traits) than others. We submit that researchers should not attribute the link between Extraversion and well-being to the trait level (i.e., Extraversion), but rather to the facet level (i.e., energy level) (Mõttus, 2016).

Effects on well-being were moderately consistent across energy-level items. All items, with the exception of "is less active than other people," were about equally related to our well-being outcomes. Thus, as Mõttus (2016) would recommend, it appears appropriate to draw inferences at the facet level. In addition, the effect of energy level on positive affect was fairly consistent across items, including those tapping high-arousal and low-arousal affects, indicating that this effect applies to positive affect in general, not just to a few specific emotions.

Item	r [95% CI]	1	2	3	4	5
Positive affect						
1	.45 [.41, .49]					
2	.42 [.38, .45]	.01				
3	.35 [.31, .39]	<.001	<.001			
4	.43 [.39, .47]	.19	.39	<.001		
5	.36 [.32, .40]	<.001	<.01	.58	<.001	
6	.42 [.39, .46]	.08	.72	<.001	.63	<.001
Negative affect						
1	−.25 [−.29, −.21]					
2	−.17 [−.22, −.13]	<.01				
3	−.22 [−.26, −.18]	.15	.01			
4	−.36 [−.40, −.32]	<.001	<.001	<.001		
5	−.34 [−.38, −.30]	<.001	<.001	<.001	.16	
6	−.25 [−.29, −.20]	.88	.01	.34	<.001	<.001
Happiness						
1	.58 [.53, .62]					
2	.51 [.46, .55]	<.001				
3	.54 [.49, .58]	<.01	.04			
4	.49 [.44, .54]	<.001	.37	.01		
Life satisfaction						
1	.39 [.35, .43]					
2	.36 [.32, .40]	.04				
3	.40 [.37, .44]	.45	.01			
4	.33 [.29, .37]	<.001	.14	<.001		
5	.31 [.27, .35]	<.001	.02	<.001	.31	

TABLE 4 Correlations between well-being items and energy-level and *p* values testing differences between correlations

4.1 | Limitations and future directions

Three limitations pertain to our measures. First, we used the same 12-item affect measure in each study rather than including diverse affect scales. However, considering the relative clarity of our results, we find it unlikely that other affect measures would have shown dissimilar patterns. This prediction can be verified in future studies. Furthermore, our results were consistent across affect measures with different timeframes (e.g., 1 week vs. 5 months).

Second, we relied on the facet structure of the BFI-2. Because the facet structure of the Big Five is unknown, we do not know whether the three facets we examined are indeed the correct and only facets of Extraversion.

Third, two of the four items measuring energy level include positive emotional states (i.e., "excited or eager" and "enthusiasm"). Thus, the energy level facet may be measuring positive affect, in which case our findings would be circular. However, the item "is full of energy" predicted well-being outcomes just as well as the two items that tap positive emotional states. In addition, our affect measures did not include items such as "excited," "eager," "enthusiastic," or synonyms of these

words. Furthermore, if the energy-level facet was simply tapping positive emotions, it likely would have correlated with positive affect to a greater extent than we observed. Finally, even if our results are tautological, they still indicate that the effect of Extraversion on positive affect is not occurring at the trait level (cf. Mõttus, 2016, p. 298, on circularity).

Our sample was fairly diverse in that it included college students and online older adults. In addition, our first two samples were largely Asian, Latino, and female, whereas our other three samples were mostly Caucasian and evenly split on gender. However, most of our participants hailed from developed countries and, as is the case with most psychological research, do not represent the heterogeneity of human cultures. Thus, future researchers may consider replicating our analyses in other samples and nations.

4.2 | Concluding words

Across five well-powered studies, we found a striking and consistent effect: Energy level, not sociability or assertiveness, underlies correlations between Extraversion and well-being. Accordingly, in line with Mõttus's (2016) reasoning,

we argue that the robust association found in the literature between Extraversion and well-being should not be ascribed to the general trait of Extraversion but rather to the energy-level facet.

CONFLICT OF INTERESTS

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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REFERENCES

Costa, P. T., & McCrae, R. R. (1980). Influence of Extraversion and Neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology*, *38*, 668–678. https://doi.org/10.1037/0022-3514.38.4.668

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO PI-R) and NEO five-factor inventory (NEO FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.

Diener, E., & Emmons, R. A. (1984). The independence of positive and negative affect. *Journal of Personality and Social Psychology*, *47*, 1105–1117. https://doi.org/10.1037/0022-3514.47.5.1105

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

Fleeson, W., Malanos, A. B., & Achille, N. M. (2002). An intraindividual process approach to the relationship between Extraversion and positive affect: Is acting extraverted as "good" as being extraverted? *Journal of Personality and Social Psychology*, *83*, 1409–1422. https://doi.org/10.1037//0022-3514.83.6.1409

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. G. (2006). The international personality item pool and the future of public-domain personality measures. *Journal of Research in Personality*, *40*, 84–96. https://doi.org/10.1016/j.jrp.2005.08.007

Jacques-Hamilton, R., Sun, J., & Smillie, L. D. (2018). Costs and benefits of acting extraverted: A randomized controlled trial. *Journal of Experimental Psychology: General*. Advance online publication.

Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research*, *46*, 137–155.

Margolis, S., & Lyubomirsky, S. (2019). Experimental manipulation of extraverted and introverted behavior and its effects on well-being. *Journal of Experimental Psychology: General*. Advance online publication.

Marrero Quevedo, R. J., & Carballeira Abella, M. (2011). Well-being and personality: Facet-level analyses. *Personality and Individual Differences*, *50*, 206–211. https://doi.org/10.1016/j.paid.2010.09.030

McNiel, J. M., & Fleeson, W. (2006). The causal effects of Extraversion on positive affect and Neuroticism on negative affect: Manipulating state Extraversion and state Neuroticism in an experimental approach. *Journal of Research in Personality*, *40*, 529–550. https://doi.org/10.1016/j.jrp.2005.05.003

McNiel, J. M., Lowman, J. C., & Fleeson, W. (2010). The effect of state Extraversion on four types of affect. *European Journal of Personality*, *24*, 18–35. https://doi.org/10.1002/per.738

Mõttus, R. (2016). Towards more rigorous personality trait–outcome research. *European Journal of Personality*, *30*, 292–303. https://doi.org/10.1002/per.2041

Schimmack, U., Oishi, S., Furr, R. M., & Funder, D. C. (2004). Personality and life satisfaction: A facet-level analysis. *Personality and Social Psychology Bulletin*, *30*, 1062–1075. https://doi.org/10.1177/0146167204264292

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology*, *113*, 117–143. https://doi.org/10.1037/pspp0000096

Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psychological Bulletin*, *134*, 138–161. https://doi.org/10.1037/0033-2909.134.1.138

Williams, E. J. (1959). *Regression analysis*. New York, NY: Wiley.

Zelenski, J. M., Santoro, M. S., & Whelan, D. C. (2012). Would introverts be better off if they acted more like extraverts? Exploring emotional and cognitive consequences of counterdispositional behavior. *Emotion*, *12*, 290–303. https://doi.org/10.1037/a0025169

Zelenski, J. M., Whelan, D. C., Nealis, L. J., Besner, C. M., Santoro, M. S., & Wynn, J. E. (2013). Personality and affective forecasting: Trait introverts underpredict the hedonic benefits of acting extraverted. *Journal of Personality and Social Psychology*, *104*, 1092–1108. https://doi.org/10.1037/a0032281