

A Meta-Analytic Review of the Relationship Between Dispositional Gratitude and Well-Being

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Abstract

What is the impact of dispositional gratitude on well-being? By synthesizing the literature, we evaluate the association between dispositional gratitude and mental well-being as a function of its various categories (i.e., positive, negative), dimensions (i.e., subjective, psychological), and indicators (e.g., life satisfaction, happiness, stress). Our meta-analytic aggregation of 404 effect sizes from 158 independent samples ($N = 100,099$) provides evidence that dispositional gratitude is moderately to strongly correlated with well-being, and that the strength of these associations varies by the indicator of well-being. We also examine potential moderators (i.e., religiosity, individualistic orientation, age, gender, dispositional gratitude measure, and sample type) of the association between dispositional gratitude and well-being. We find that country-level individualistic orientation, sample mean age, and sample type (i.e., clinical vs. non-clinical) present moderating effects for several of the relationships examined. We conclude the paper by presenting avenues for future research.

Keywords: gratitude; happiness; well-being; life satisfaction; depression; meta-analysis; personality

2 **1. Introduction**

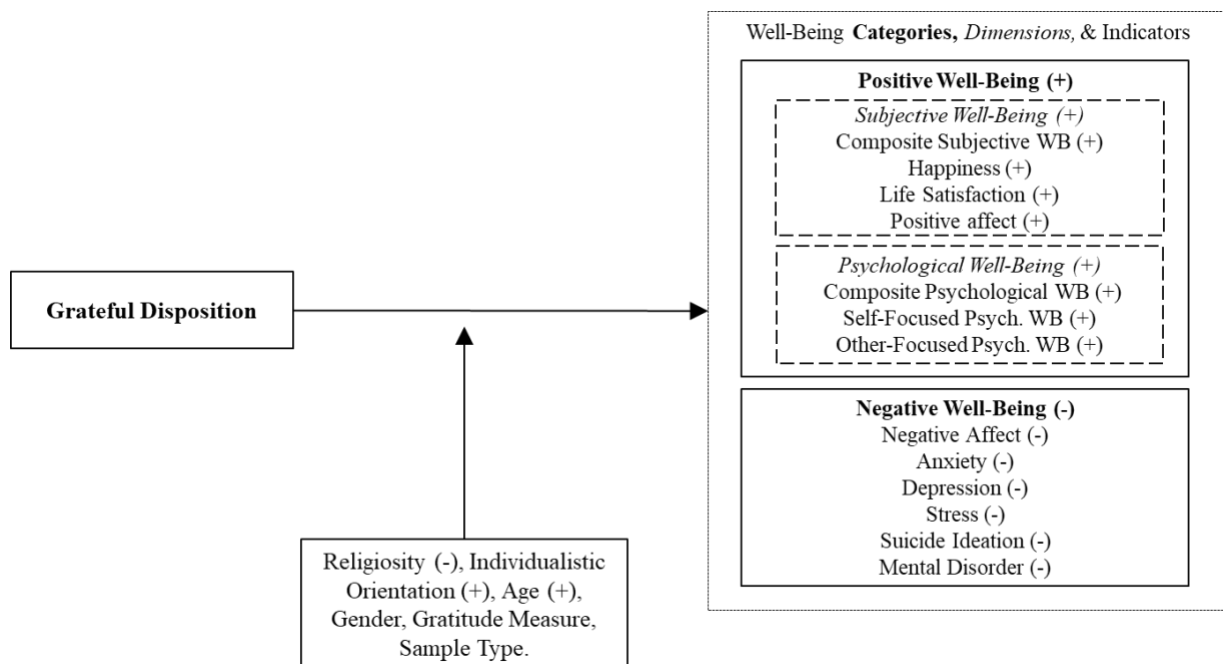
3 Well-being involves the absence of mental disorder and the existence of positive
4 psychological resources (Diener, Scollon & Lucas, 2004). Unsurprisingly, achieving and
5 maintaining well-being is a major life goal for many individuals (Sin & Lyubomirsky, 2009), and
6 understanding paths to improving individuals' well-being is a primary concern for many
7 psychologists and policymakers (Diener, Lucas, & Scollon, 2006). Dispositional gratitude is “a
8 generalized tendency to recognize and respond with grateful emotion to the roles of other
9 people's benevolence in the positive experiences and outcomes that one obtains” (McCullough,
10 Emmons & Tsang, 2002, p. 112; see also “grateful disposition” and “trait gratitude”). Scholars
11 and practitioners have demonstrated dispositional gratitude is a potential facilitator of well-being
12 because it is associated with several important phenomena, including stress, anxiety,
13 psychopathology, health, adaptive personality characteristics, positive relationships, subjective
14 well-being, and humanistic-orientated functioning (e.g., McCullough et al., 2002; Jordan,
15 Masters, Hooker, Ruiz, & Smith, 2014; Park, Peterson, & Seligman, 2004; Wood, Froh, &
16 Geraghty, 2010). Since the publication of the first measure of dispositional gratitude
17 (McCullough et al., 2002), empirical research examining its relationship with indicators of well-
18 being has grown exponentially. Although research on gratitude generally supports a link between
19 dispositional gratitude and well-being, the evidence suggests there may be important differences
20 in how strongly dispositional gratitude is associated with various components of well-being.
21 Consequently, the central research question for our meta-analytic review is: How strongly does
22 dispositional gratitude relate to different components of mental well-being in adulthood? We
23 complement our systematic, quantitative review by exploring various moderators of the
24 relationship between dispositional gratitude and well-being.

25 This review offers three important contributions. First, we explore the meta-analytic
26 correlations between dispositional gratitude and a comprehensive set of indicators of well-being.
27 This contributes to the emerging scholarly literature on gratitude, where dispositional gratitude
28 plays a foundational role and well-being is one of its most important outcomes. We also examine
29 the differences in magnitude among these associations, which we discuss as having implications
30 for future research on gratitude and well-being interventions. In addition, we test several
31 moderators of these relationships, further illuminating the link between gratitude and well-being.

32 Our second contribution is to the personality and well-being literature. An important line
33 of research on well-being is focused on the relationship between several of its indicators (i.e.,
34 happiness, life satisfaction, etc.) and personality (Steel, Schmidt, & Schultz, 2008). In two meta-
35 analyses, scholars have examined the relationship between personality traits and subjective well-
36 being. DeNeve and Cooper (1998) explored the relationship between 137 personality traits –
37 gratitude was not one of them – and subjective well-being, concluding that personality is one of
38 the most important predictors of subjective well-being and its indicators. Subsequently, Steel and
39 his colleagues (2008) conducted another systematic review on the association between
40 personality and different indicators of subjective well-being, concluding that personality
41 (measured as the Big Five) is significantly related to all indicators of subjective well-being. In
42 the current study, we suggest dispositional gratitude may be one of the best predictors of well-
43 being, and should be included in future personality research related to well-being. Importantly, in
44 our online supplemental material, we compare our meta-analytic results with those from the two
45 previous meta-analytic reviews (DeNeve & Cooper, 1998; Steel et al., 2008), finding that
46 dispositional gratitude is one of the best personality predictors of different indicators of
47 subjective well-being.

48 As a third contribution to the well-being literature, we provide a comprehensive
 49 categorization of the theoretical structure of well-being based on theoretical and empirical
 50 arguments. This taxonomy includes three levels of analysis: indicators (e.g., measures of life
 51 satisfaction, social well-being, positive affect, stress, depression); dimensions (clusters of well-
 52 being indicators; e.g., the subjective well-being dimension is formed by combining happiness,
 53 life satisfaction, and positive affect), and categories (clusters of well-being indicators or
 54 dimensions; i.e., the category of negative well-being is formed by combining several indicators –
 55 depression, stress, anxiety, negative affect, and suicidal ideation – and the category positive well-
 56 being is formed by combining two dimensions – subjective well-being and psychological well-
 57 being). We use this categorization to determine the differences in the magnitudes of the
 58 relationships between dispositional gratitude and the various components of well-being. We
 59 suggest avenues for future empirical work to further examine the hierarchical structure of well-
 60 being developed herein. We present our theoretical model in Figure 1.

61 Figure 1. Gratitude & Well-Being



62

63 **2. Dispositional Gratitude and Well-Being**

64 Personality is one of the best predictors of well-being (DeNeve & Cooper, 1998; Diener,
65 Eunkook, Lucas, & Smith, 1999; Steel et al., 2008). Certain affective and cognitive traits, mainly
66 associated with extraversion or neuroticism, predispose individuals to evaluate and react to
67 events in ways that directly influence their well-being (Ozer & Benet-Martinez, 2006).
68 Individuals with high levels of extraversion and low levels of neuroticism appraise and react to
69 events more positively and pay less attention to negative feedback. Importantly, because
70 dispositional gratitude is not part of the Five Factor Model of personality (Costa & McCrae,
71 1992) and measures of dispositional gratitude have only been developed recently (since 2002),
72 its influence on well-being has not been evaluated in prominent reviews on personality and well-
73 being (DeNeve & Cooper, 1998; Steel et al., 2008).

74 Gratitude has emerged as an important topic in psychology, and research on dispositional
75 gratitude and its relationship to different indicators of well-being has gained traction in the past
76 two decades (e.g., Emmons & Mishra, 2011; McCullough et al., 2002; McCullough, Tsang &
77 Emmons, 2004). Several researchers have investigated trait gratitude as an important predictor of
78 well-being and other desirable life outcomes (e.g., Barlett & DiSteno, 2006; Emmons &
79 McCullough, 2003; McCullough et al., 2002; McCullough et al., 2004). In this section, we
80 distinguish dispositional gratitude from the emotion of gratitude. Then, we present a
81 comprehensive categorization of well-being. Finally, we provide theoretical arguments for the
82 relationship between dispositional gratitude and well-being, and its moderators.

83 **2.1. Dispositional Gratitude**

84 Although the amount of empirical research on gratitude increased dramatically in the 15
85 years following the publication of the first measure of dispositional gratitude (McCullough et al.,

86 2002), gratitude has been long recognized as one of the building blocks of societies (Simmel,
87 1950). Dispositional gratitude is an individual difference which reflects how frequently and
88 intensely individuals experience the emotion of gratitude, and the range of events which elicit
89 gratitude as an emotion. The emotion occurs after individuals receive aid they perceive as costly,
90 valuable, and altruistic (Tesser, Gatewood, & Driver, 1968; Wood et al., 2008). Bertocci and
91 Millard defined gratitude, the emotion, as “the [pleasant] willingness to recognize that one has
92 been the beneficiary of someone’s kindness” (Gulliford et al., 2013, p. 300). The emotion is
93 positively valenced and related to regularly experiencing other positive emotions (Wood et al.,
94 2010). Thus, individuals higher in dispositional gratitude will have a lower threshold for the
95 experience of the grateful emotion (McCullough et al., 2004).

96 McCullough, Emmons and Tsang (2002), in their development of the first measure of the
97 grateful disposition, adopted the following definition: “a generalized tendency to recognize and
98 respond with grateful emotion to the roles of other people’s benevolence in the positive
99 experiences and outcomes that one obtains” (p. 112). Wood and his colleagues (2010) develop a
100 wider understanding of dispositional gratitude, and go beyond the role of other people’s
101 benevolence to suggest dispositional gratitude involves a generalized tendency “towards noticing
102 and appreciating the positive in the world” (p. 891). The grateful disposition is associated with
103 experiencing gratefulness—the emotion, appreciating others, a focus on what the person has,
104 feelings of awe when encountering beauty, engaging in behaviors to express gratitude,
105 appreciation stemming from an understanding that life is short, a focus on enjoying the present
106 moment, and engaging in positive social comparisons (Adler & Fagley, 2005, Wood et al.,
107 2008). Expanding upon and incorporating aspects of existing definitions (e.g. McCullough et al.,
108 2002; Wood et al., 2010), we define *dispositional gratitude* as a generalized tendency to respond

109 with grateful emotion, by noticing and appreciating one’s positive experiences and
110 achievements.

111 **2.2. Well-Being**

112 Well-being represents the presence of indicators of psychological adjustment such as life
113 satisfaction, happiness, or positive affect, and the absence of indicators of psychological
114 maladjustment such as negative affect, depression, or stress (Diener et al., 2004; Houben et al.,
115 2015). In Figure 1, we present our hierarchical conceptualization of well-being, which includes
116 three hierarchical levels, which we term categories, dimensions, and indicators. At the highest
117 level, we examine two categories of well-being: [1] positive well-being, which includes
118 indicators of psychological adjustment and [2] negative well-being, which includes indicators of
119 psychological maladjustment.¹

120 The first category, positive well-being, encompasses the two dimensions described by
121 Ryan and Deci (2001): subjective well-being and psychological well-being. As Ryan and Deci
122 (2001) noted, the field of well-being has witnessed the creation of “two relatively distinct, yet
123 overlapping, perspectives and paradigms for empirical inquiry into well-being that revolve
124 around two distinct philosophies” (p. 142). The emergent body of literature from positive,
125 personality, and clinical psychology examining the nature and structure of well-being includes at
126 least two distinct perspectives. Some scholars argue the distinction between subjective and
127 psychological well-being is theoretically and empirically valid (e.g., Linley, Maltby, Wood,
128 Osborne, & Hurling, 2009; Ryan & Deci, 2001). Other researchers argue this distinction does not

¹ Note: In our review, we found there are several variables (i.e., self-esteem, optimism, vitality, and loneliness) for which there is not scholarly consensus regarding whether they are indicators of well-being or adjacent constructs. Some researchers conceptualized and tested the constructs as indicators of personal well-being and positive functioning (e.g., McCullough et al., 2002; Wood et al., 2010), while others have represented them as mediators or moderators of the relationship between dispositional gratitude and personal well-being (e.g., Emmons & Mishra, 2011; Lin, 2015).

129 provide theoretical utility and is not empirically valid (e.g., Disabato, Goodman, Kashdan, Short,
130 & Jarden, 2015; Sheldon, 2013). Given this ongoing debate on the structure of well-being, we
131 include an overarching positive well-being category as well as its two individual dimensions.

132 Subjective well-being, a dimension of positive well-being, represents the hedonic
133 perspective, which consists of a focus on an individual’s minimization of pain and maximization
134 of pleasure. Diener’s (1984) tridimensional model of subjective well-being (life satisfaction,
135 positive affect, and negative affect) is the most widely used model in empirical research in the
136 field (e.g., Disabato et al., 2015). As previously mentioned, our conceptualization of well-being
137 also includes negative indicators of well-being (e.g., depression, anxiety, stress, etc.), which are
138 more strongly related to negative affect (correlations ranging from 0.25 to 0.65; e.g., Gavian,
139 2011; Bernard, 2015) than life satisfaction and positive affect. Because of these previous
140 asymmetrical relationship strengths, we follow the Houben, Van Den Noortgate, and Kuppens
141 (2015) taxonomy of well-being by excluding negative affect from the subjective well-being
142 dimension (we include it as part of the negative well-being category). Previous work on
143 subjective well-being (e.g., Diener, Scollon, & Lucas, 2004) suggests the dimension can be
144 disaggregated into an affective component, including an individual’s subjective experiences (i.e.,
145 positive affect), and a cognitive component, including the subjective evaluations of the
146 individual (i.e., life satisfaction, happiness). Thus, in addition to life satisfaction and positive
147 affect, we also incorporate happiness as part of the subjective well-being dimension.

148 Psychological well-being, the second dimension of positive well-being, represents the
149 eudaimonic perspective, which suggests a difference between pleasure (hedonic perspective) and
150 the good life, “with Aristotle defining a good life as living to one’s fullest potential in
151 accordance with virtue or excellence” (Disabato et al., 2015). Although there is no consensus

152 regarding a single theory or perspective pertaining to eudaimonia, one of the most cited
153 perspectives is psychological well-being, which defines well-being as an individual model of
154 positive psychological functioning (Ryff, 1989). Five components (self-acceptance, autonomy,
155 environmental mastery, purpose in life, personal growth) represent facets of psychological
156 functioning oriented to the self. The sixth component, positive relations with others, represents a
157 facet of psychological functioning directed at one's relationships with others. We grouped these
158 psychological well-being components to create two indicators (Barrett-Cheetham, Williams, &
159 Bednall, 2016): self-focused psychological well-being (self-acceptance, autonomy,
160 environmental mastery, purpose in life, personal growth) and other-focused psychological well-
161 being (positive relations with others).

162 Presently, the positive well-being category represents the “presence of positive indicators
163 of psychological adjustment such as positive emotionality, happiness, high self-esteem, or life
164 satisfaction” (Houben et al., 2015, p. 901). However, well-being also encompasses “indicators of
165 psychological maladjustment such as negative emotionality, psychopathological symptoms and
166 diagnoses” (Houben et al., 2015, p. 901), which have been found to relate differently in terms of
167 relationship magnitudes to outcomes compared to positive indicators (Gavian, 2011; Bernard,
168 2015). Therefore, we designate a separate negative well-being category, which represents
169 psychological maladjustment and is primarily represented by indicators of the Axis 1 (emotion-
170 based disorders) of the Diagnostic and Statistical Manual of Mental Disorder (American
171 Psychiatric Association, 2013). This category includes the following constructs: negative affect,
172 anxiety, stress, depression, suicide ideation, and other measures of lack of mental health (Dittmar
173 et al., 2014). Several studies measure the constructs as part of the assessment of well-being,
174 related to the absence of mental illness (e.g., Aghababaei & Tabik, 2013; McCullough et al.,

175 2002). Research suggests there is an irreducible minimum correlation of .5 among measures of
176 anxiety, stress, and depression (e.g., Beck, Epstein, Brown, & Steer, 1988; Lovibond &
177 Lovibond, 1995). Furthermore, absolute correlations between composite measures of mental
178 health and measures of the other indicators included in this well-being category have previously
179 ranged from 0.35 to 0.70 (e.g., Rosmarin, Pirutinsky, Cohen, Galler, & Krumrei, 2011; Lies,
180 Mellor, & Hong, 2014). The research Lovibond and Lovibond (1995) conducted on the structure
181 of negative aspects of psychological well-being suggests the high correlations between different
182 sets of indicators in this category “are not the result of the scales measuring overlapping
183 constructs. Rather, these correlations may reflect common causes” [of the symptoms/states such
184 as anxiety, stress, and depression.] (p. 342). Furthermore, Lovibond & Lovibond (1995) argued
185 these negative states associated with a lack of well-being are attributable to “a common
186 vulnerability factor, such as neuroticism or negative affect, and common environmental
187 activation” (p. 342). The common-cause arguments help to explain the moderate to high
188 correlations between measures of negative affect and the constructs included in this category,
189 ranging from 0.25 to 0.65 (e.g., Gavian, 2011; Bernard, 2015). Therefore, we include negative
190 affect as part of the negative well-being category rather than in the subjective well-being
191 dimension.

192 **2.3. The Relationship between Dispositional Gratitude and Well-Being**

193 Scholars have identified several mechanisms underlying the relationship between
194 gratitude and well-being. Grateful individuals experience higher well-being through schematic
195 biases that allow them to experience helpful actions from others as more beneficial to the self
196 (Wood et al., 2008). Being grateful facilitates coping with stress and reduces the experience of
197 toxic emotions resulting from social comparisons (Emmons & Mishra, 2011). Moreover, the

198 habitual experience of positive emotions by grateful individuals facilitates resistance to mental
199 disorders and general stressors (Fredrickson, 2004; Fredrickson & Joiner, 2002). Additionally,
200 being grateful is associated with several other mechanisms influencing well-being (e.g. Emmons
201 & Mishra, 2011; Wood et al., 2010): improved self-esteem, enhanced accessibility to positive
202 memories, higher spirituality and mindfulness, facilitated goal attainment, more social resources,
203 and improved physical health. In summary, several theoretical explanations and mechanisms
204 directly and indirectly link dispositional gratitude to components of well-being.

205 Happiness and well-being do not increase spontaneously; rather, the introspection
206 required for enduring happiness is central to the nature of grateful individuals (Wood et al.,
207 2008). Empirical findings suggest grateful individuals are more likely to engage in such positive
208 self-cognitions, which can lead to enduring happiness and well-being (e.g., Wood et al., 2008).
209 Dispositional gratitude also plays an important role in one’s adaptation to significant life events,
210 “adaptation to satisfaction can be counteracted by constantly being aware of how fortunate one’s
211 conditions are, and how it could have been otherwise, or actually was otherwise before” (Frijda,
212 2007, p.14). Given the multiplicity of mechanisms linking gratitude to well-being, we expect
213 dispositional gratitude to be (at least) moderately related to the categories, dimensions, and
214 indicators of well-being.

215 **2.4. Moderators of the Dispositional Gratitude-Well-Being Link**

216 **Religiosity.** The grateful disposition has consistently been considered a critical human
217 quality in the Jewish, Christian, Muslim, Buddhist, and Hindu traditions for fostering community
218 and well-being (Emmons, 2004). In Jewish teachings, gratitude towards God is believed to
219 motivate proper behavior (Schimmel, 2004). As a parallel, if the grateful virtue is the disposition
220 to feel gratitude to the right person, for the right thing at the right time, then “Christian gratitude

221 is the disposition to feel grateful to God for the gift of his Son, at all times” (Roberts, 2004, p.
222 72-73). Several stories of the Torah and the Bible reflect gratitude to humans for benefits that are
223 appreciated (Emmons, 2004). Additionally, the “Quran asks people to be grateful, not only to
224 Allah for his many gifts and mercies, but also to each other” (Aghababaei & Tabik, 2013, p.
225 765). Also, numerous Buddhist histories (or vamsas) display gratitude among their characters
226 (Berkwitz, 2003). Because of its value as a virtue in many religions, we would expect individuals
227 in highly religious contexts to be consistently grateful (i.e., religiosity functions as a social norm
228 for how grateful individuals should be). This reduced variability in dispositional gratitude levels
229 in highly religious contexts should in turn weaken its association with well-being (and other
230 variables). We expect *the relationship between dispositional gratitude and well-being to be*
231 *weaker in highly religious contexts compared to contexts with low religiosity levels.*

232 **Individualistic orientation.** Individualism-collectivism orientation, a bias toward
233 personal or collective goals and desires (Morris & Peng, 1994), also labeled independence-
234 interdependence (Markus & Kitayama, 1991), is a broad cultural variable (Hofstede, 2001)
235 shown to influence both dispositional gratitude and well-being separately (Cohen, 2006; Diener,
236 Diener, & Diener, 1995; Ryan & Deci, 2001). Collectivistic cultures (i.e., cultures with low
237 individualistic orientations) present stronger norms around gratitude and have a high expectation
238 that social exchanges include gratitude (Cohen 2006; Lin, 2014). Since individualistic cultures
239 place less emphasis on that expectation, such societies likely exhibit more individual variation in
240 displays of gratitude. With respect to well-being, research suggests individualistic orientation is a
241 predictor of subjective well-being (Diener et al., 1995) because it is likely an individual with a
242 high collectivistic orientation will experience well-being as a function of their fit (or lack of fit)
243 with their social surroundings. Similarly, Boehm, Lyubomirsky, and Sheldon (2011) suggest

244 well-being interventions focusing on the self may be less effective for individuals from
245 collectivistic societies than those from societies with a higher individualistic orientation. Since
246 we would expect more individual variation in the display of gratitude in individualistic cultures
247 because individualistic orientations are more strongly associated with well-being than
248 collectivistic orientations, the association between dispositional gratitude and well-being should
249 be strongest in cultures that have high individualistic orientation. The opposite should be true in
250 cultures that are highly collectivistic and have strong norms around displays of gratitude.
251 Therefore, we expect *the relationship between dispositional gratitude and well-being to be*
252 *stronger in individualistic cultures than in collectivistic cultures.*

253 **Age.** There are developmental patterns associated with the grateful disposition (Allemand
254 & Hill, 2016; Chopik, Newton, Ryan, Kashdan, & Jarden, 2018; McAdams & Bauer, 2004) and
255 how this relates to individual well-being. Individuals start experiencing gratitude at age 4 or 5
256 (Wellman, 1990), as they begin to understand that others engage in free will, and respond in
257 kind. This grateful experience will continue developing into adolescence and early adulthood
258 along with the influence of several environmental factors (McAdams and Bauer, 2004). During
259 midlife, generativity, “the concern in establishing and guiding the next generation” (Erickson,
260 1963, p. 267) represents the primary developmental task for many individuals (McAdams, 2001),
261 and is an important predictor of individuals’ well-being (e.g., de St. Aubin & McAdams, 1995).
262 Generativity and gratitude are linked to one another (McAdams & Bauer, 2004), as one must
263 exhibit gratitude (e.g., for others who have guided them) to engage in generativity. As noted by
264 McAdams (2001), many highly generative adults prioritize nurturing and taking care of the
265 world. As such, generativity can interact with gratitude to strengthen well-being. Given the

266 positive association between generativity and age, we expect that *as individuals age, more*
267 *grateful individuals will experience higher levels of well-being.*

268 **Gender.** As noted by Kashdan, Mishra, Breen, & Froh (2009), women, compared to men,
269 may be more grateful. They suggest men are “less likely to feel and express gratitude, made
270 more critical evaluations of gratitude, and derived fewer benefit” (p. 691). However, a meta-
271 analysis suggests negligible differences between men and women for most personality constructs
272 (Hyde, 2005). We include gender as an exploratory moderator, but do not have any expectations
273 about its role on the relationship between the grateful disposition and well-being.

274 **Gratitude Measure.** As we discuss in the method section, 11 measures of dispositional
275 gratitude have been developed and used to assess its relationship to different indicators of well-
276 being (see Table 3 in the method section). We examine whether the effect sizes of interest varied
277 as a function of the measure used. Although we do not have expectations about this, it may be a
278 useful design consideration for future work.

279 **Sample type.** Another important design consideration is sample selection. Given the
280 unique characteristics of undergraduate and graduate student populations (e.g. education), we
281 compare whether student samples vary in the relationship between personality and well-being
282 compared to non-student samples. Additionally, given the potential use of gratitude practices
283 among clinical populations, we examine whether effect sizes vary as a function of study
284 participants being a part of clinical vs. non-clinical samples. We made no predictions regarding
285 the sample type.

286 **3. Method**

287 **3.1. Inclusion Criteria**

288 We included empirical articles that correlated a measure of dispositional gratitude (Table
289 3) with at least one indicator of well-being included in our typology (Figure 1). A description of
290 the inclusion criteria is shown in Table 1.

291 Table 1. Criteria for Inclusion

-
1. Population studied: Adulthood (18 years & older)
 2. Dispositional gratitude (NOT a scale measuring the emotion or mood) has to be quantitatively measured.
 3. Well-being has to be quantitatively measured, using at least one of the indicators included in the review.
 4. The scales used need to have high face-validity, as assessed by the coding team.
 5. A correlation between dispositional gratitude and well-being is included in the study.
 6. If the study is experimental, the measures of both gratitude and well-being variables (and their corresponding correlation) need to be from before the treatment (Pre-treatment observation).
 7. Studies published by December 2018.
 - 292 8. Studies published in English, Spanish, or Portuguese (languages accesible by the research team).
-

293 3.2. Search Strategy

294 The search strategy includes three complementary approaches designed to maximize
295 exhaustiveness (Table 2: Steps 1-3). First, using EBSCO, we conducted a systematic literature
296 search in Academic Search Complete, CINAHL Complete, ERIC, MEDLINE Complete,
297 PsycArticles, and PsycInfo to identify studies containing our variables of interest. The
298 combination of terms we used in the search are displayed in Table 2. Second, we reviewed the
299 reference lists of all articles included in the previous step and six existing review articles on
300 gratitude for relevant studies that may have not been captured in Step 1. Finally, we requested
301 articles and unpublished data directly via emails to authors we identified during the previous
302 steps. The results of the literature search are presented in Figure 2. The search process resulted in
303 144 manuscripts (158 independent samples) and 404 effect sizes ($N = 100,099$) included in the
304 meta-analytic review.

Table 2. Literature Search Strategy

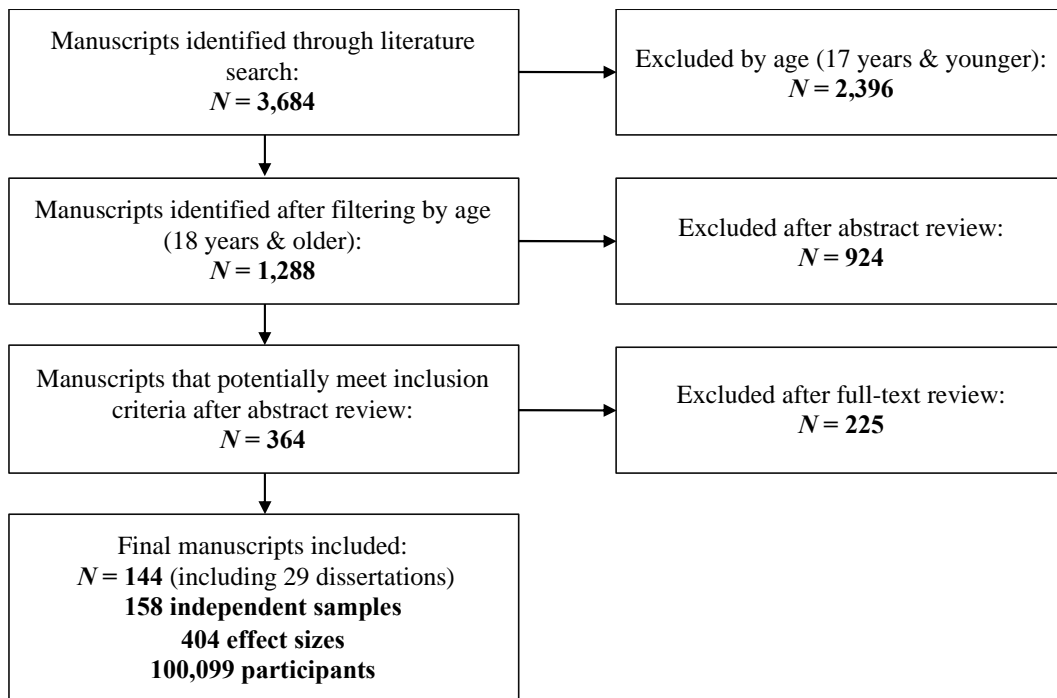
STEP 1	<p><i>Using EBSCO, search in the following databases:</i> Academic Search Complete, CINAHL Complete, ERIC, MEDLINE Complete, PsycArticles, PsycInfo</p> <p><i>Keywords used:</i> Gratitude, gratefulness, OR grateful; AND well-being, happiness, satisfaction, positive affect(ivity), neegative affect(ivity), mood, emotionality, self-actualization, depression, anxiety, OR stress</p>
STEP 2	<p><i>Manual cross-referencing of all articles included in our review, two qualitative review articles, one quantitative review on gratitude and prosociality, and three meta-analytic reviews on gratitude interventions:</i></p> <ol style="list-style-type: none"> 1. Wood, Froh, & Geraghty (2010) 2. Emmons & Mishra (2011) 3. Davis, Choe, Meyers, Wade, Varjas, Gifford, & Worthington (2015) 4. Lavelock, Griffin, Worthington, Benotsch, Lin, Greer, & Hook (2016) 5. Dickens (2017) 6. Ma, Tunney, & Ferguson (2017)
STEP 3	<p><i>Consultation:</i> Requests for published articles, in press articles, and unpublished data were distributed to scholars whose work had been included in the review.</p>

Note: Words in bold letter are part of PsycInfo's controlled vocabulary.

306

307

Figure 2. PRISMA Chart: Literature Search



308

309 **3.3. Coding Procedures**

310 Every included study reported at least one correlation representing the relationship
311 between dispositional gratitude and an indicator of well-being. A team of three coders coded the
312 studies. The coders were doctoral students specializing in a related field, with expertise in
313 personality research. As a first step, all three coders coded the same set of randomly selected 10
314 manuscripts (representing 12 individual samples and 32 effect sizes), from which we assessed
315 interrater reliability by calculating agreement among the three coders in each of the codes (e.g.,
316 sample size, effect size, dispositional gratitude measure used). Our agreement per code ranged
317 from .94 to 1. After examining the results of the first coding stage, the remaining 134
318 manuscripts were each coded by only the first two coders. For the second step, the average
319 interrater reliability indices for the same variables ranged from 0.95 to 1. We identified each
320 code where disagreements occurred and returned to the manuscripts to determine the error and
321 extract the correct values.

322 **3.4. Moderators**

323 **Religiosity.** Following the work by Ma and colleagues (2017), we coded the level of
324 religiosity for each country represented in the analysis (USA: 56%; Canada: 40%; England:
325 30%; Italy: 74%; Spain: 37%; Switzerland: 38%; China: 7%; Japan: 13%; Korea: 44%;
326 Philippines: 86%; Indonesia: 82%; Israel: 30%; and Turkey: 79%; Australia: 34%; South Africa:
327 91%, Colombia: 82%; Peru: 82%) using the Gallup International Religiosity Index (Gallup
328 International Survey, 2014).

329 **Individualistic orientation.** We coded the level of individualism for each country
330 represented in our analysis (USA: 91; Canada: 80; England: 89; Italy: 76; Spain: 51;
331 Switzerland: 68; China: 20; Japan: 46; Korea: 18; Philippines: 32; Indonesia: 14; Israel: 54; and

332 Turkey: 37; Australia: 90, South Africa: 65, Colombia: 13; Peru: 16; Iran: 41; Hong Kong: 25;
 333 Taiwan: 16) using scores from the Hofstede Insights' Country Comparison Tool (Hofstede
 334 Insights, 2018).

335 **Age of participants.** For each sample, we coded the average age of the participants.

336 **Gender.** We coded the percentage of women in each individual sample.

337 **Gratitude measure.** As shown in Table 3, eleven measures of dispositional gratitude
 338 have been used in the studies included in the present meta-analysis. The Gratitude Questionnaire
 339 (GQ-6; McCullough et al., 2002) is the first published measure of dispositional gratitude and was
 340 used in over 75% of the included studies in the present review. The GQ-6 has consistently been
 341 shown to present adequate psychometric properties, including high internal reliability estimates
 342 and cross-cultural validity when translated to other languages. Given the proportion of studies
 343 using the GQ-6 and the fact that it was developed using the definition of dispositional gratitude
 344 we adopted, we combined all other measures into one category. Thus, we use a dummy variable
 345 to test whether there is a difference in the effect sizes calculated using the GQ-6 versus the
 346 combined effect sizes of all other measures.

347 Table 3. Grateful Disposition Measures

<i>Measures</i>	<i># of items</i>	<i>k</i>
Gratitude Questionnaire-6 (GQ6; McCullough, Emmons, & Tsang, 2002)	6	123
Values in Action Inventory of Strengths - Gratitude (VIA-IS; Peterson, Park & Seligman, 2005)	10	15
Gratitude, Resentment, and Appreciation Test (GRAT; Watkins, Woodward, Stone, & Kolts, 2002)	44	8
Inventory of Undergraduates' Gratitude (IUG; Lin & Yeh, 2011)	25	2
Gratitude, Resentment, and Appreciation Test - Short (GRAT-S; Thomas & Watkins, 2003)	16	2
Single Item Measure of Gratitude (Proctor, Linley, & Maltby, 2010)	1	2
Gratitude Scale (Alarcon, 2011)	18	2
Gratitude Questionnaire-24 (Bernabe, 2012)	24	1
Appreciation - Gratitude (Adler & Fagley, 2005)	10	1
The Multi-Component Gratitude Measure (Morgan, Gulliford, & Kristjánsson, 2017)	29	1
Gratitude During Pregnancy (O' Leary, Dockray, Hammond, 2016)	18	1

348 Note: *k* = # studies in meta-analysis that used measure.

349 **Sample type.** We coded two dummy variables: whether or not each individual sample
350 consisted exclusively of university students and whether or not each individual sample consisted
351 of individuals with a clinical diagnosis (e.g., depression).

352 **3.5. Statistical Methods**

353 We aggregated the individual correlations from each study, adjusting for sample size,
354 using meta-analytic analyses. Thus, the study served as the unit of analysis. To analyze the data
355 coded, we utilized the meta-analytic software Comprehensive Meta-Analysis Version 3.3
356 (Borenstein, Hedges, Higgins, & Rothstein, 2014). We used random effects models. It is worth
357 noting that for the present study, we have combined different indicators of well-being, according
358 to our categories of well-being (see Figure 1). Following the Hedges and Olkin meta-analytic
359 method, for each meta-analysis conducted, each effect size (ES) was weighted by the sum of the
360 inverse sampling variance plus the between-study variance, Tau-squared (τ^2 ; Borenstein,
361 Hedges, Higgins, & Rothstein, 2009). When the manuscripts included in our review presented
362 more than one sample, the correlations were analyzed independently. In cases where manuscripts
363 reported several correlations of the same relationship, an average correlation was computed to
364 maintain independence.

365 For each analysis, we calculated the mean ES across studies (r); its 95% confidence
366 interval; the Q statistic, a within-group homogeneity statistic that has an approximate chi-square
367 distribution with $k - 1$ degrees of freedom along with its corresponding p -value; the I^2 statistic,
368 which indicates the proportion of the variation in the observed effects that reflects the variance in
369 true effects rather than sampling error; Tau (τ) and τ^2 , which represent the standard deviation
370 and the variance in true effects, respectively; and a prediction interval containing 95% of the
371 “true” values of the ESs. In addition, to try to account for the existing variation across ESs, we

372 examined several moderators. We analyzed sub-groups using the categorical moderators that
373 were coded (Borenstein et al., 2009). Furthermore, we used meta-regression to examine
374 continuous moderators. Consistent with best research practices, we did not include more than
375 one covariate for every ten studies incorporated in the regression model (Schulze, 2007). Finally,
376 we interpret ESs as follows: small/weak effects sizes are correlations of .1 or smaller,
377 medium/moderate effects are between a .1 and .5, and large/strong effects are .5 or larger
378 (Cohen, 1988).

379 **3.6. Publication Bias**

380 To estimate possible effects of publication bias, we used: (1) the trim-and-fill procedure
381 (Duval & Tweedie, 2000) to impute potentially missing studies, (2) the Orwin's fail-safe N to
382 compute the number of additional studies required (with an ES of 0) to reduce the summary
383 effect found in the analysis to a trivial level of $r = .1$ (Borenstein et al., 2014), and (3) meta-
384 regression to examine whether the sample size moderated the relationship between dispositional
385 gratitude and well-being. We did not find evidence of publication bias. The results of our
386 publication bias assessment are presented in the supplementary materials.

387 **4. Results²**

388 Our first research question pertains to the strength of the association between
389 dispositional gratitude and the different components of well-being. Table 4 presents the results of
390 the meta-analyses, with effects aggregated at the well-being category, dimension, and indicator
391 levels. Dispositional gratitude is positively and moderately related to all dimensions, and
392 indicators of positive well-being (correlations ranged from .40 to .48). We also found that

² In the supplementary materials, we present a summary table of all studies included in the meta-analysis. The table describes the number of participants, type of publication, country of participants, percentage of female participants, type of sample, positive well-being and negative well-being indicators used, mean ES, and 95% CI of the ES.

393 dispositional gratitude has a moderately negative relationship with indicators of negative well-
394 being (correlations ranged from -.42 to -.27).

395 At the highest well-being categorization (positive versus negative well-being), in absolute
396 terms, dispositional gratitude is more strongly associated with positive well-being ($r = .42$, 95%
397 CI [.40, .45]) than negative well-being ($r = -.33$, 95% CI [-.35, -.30]). The observed level of
398 variation in the distributions of the ESs representing the associations between dispositional
399 gratitude and both positive well-being ($\tau = .15$, $\tau^2 = 0.02$) and negative well-being ($\tau = .11$, $\tau^2 =$
400 .01) are non-negligible. The 95% prediction interval, defined as the interval within which an
401 individual's association between his/her level of dispositional gratitude and well-being would
402 fall if that individual were selected at random from its population (Borenstein et al., 2009),
403 ranges from .15 to .63 for positive well-being and ranges from -.48 to -.10 for negative well-
404 being.

405 Subjective well-being, one of the two dimensions of positive well-being, presents a meta-
406 analytic association of $r = .43$ (95% CI [.40, .45]); the distribution of the ES presents non-
407 negligible variation and heterogeneity ($\tau = 0.15$, $\tau^2 = .02$), with a 95% prediction interval
408 ranging from moderate to large [.15, .64]. Regarding the indicators of subjective well-being,
409 dispositional gratitude is more strongly correlated with the cognitive components (happiness, life
410 satisfaction) than the affective component of subjective well-being (positive affect). We find a
411 statistically significant difference across the ESs of dispositional gratitude and life satisfaction (r
412 = 0.43, 95% CI [.41, .46]), dispositional gratitude and happiness ($r = 0.48$, 95% CI [.43, .53]),
413 and dispositional gratitude and positive affect ($r = 0.40$, 95% CI [.36, .43], $Q(1) = 6.49$, $p = .04$).

Table 4. Summary of Meta-Analytic Results by Well-Being Category, Dimension, and Indicator

Well-Being Categories, Dimensions, and Indicators	<i>N</i>	<i>k</i>	<i>r</i>	95% CI		95% PI		Heterogeneity			
				L	U	L	U	<i>Q</i>	<i>I</i> ²	τ	τ^2
Positive Well-Being	90,558	138	.42	.40	.45	.15	.63	1972.75	93.06	.15	.02
<i>Subjective Well-Being</i>	82,522	120	.43	.40	.45	.15	.64	1941.62	93.87	.15	.02
Composite	31,122	23	.45	.36	.52	.01	.75	1284.01	98.29	.23	.05
Happiness	10,302	27	.48	.43	.53	.19	.70	270.24	90.38	.16	.03
Life Satisfaction	62,399	87	.43	.41	.46	.23	.60	844.80	89.82	.12	.01
Positive Affect	31,061	49	.40	.36	.43	.20	.59	494.31	90.29	.14	.02
<i>Psychological Well-Being</i>	33,222	43	.44	.40	.48	.14	.67	695.87	94.40	.16	.03
Composite	21,682	10	.46	.37	.54	.13	.70	268.75	96.65	.15	.02
Self-Focused	5,445	24	.44	.36	.50	.06	.70	200.57	90.03	.19	.04
Other-focused	6,132	19	.47	.39	.54	.08	.73	221.94	92.79	.19	.04
Negative Well-Being	44,932	95	-.33	-.35	-.30	-.48	-.10	560.66	83.23	.11	.01
Negative Affect	27,607	41	-.27	-.31	-.23	-.47	-.05	269.05	85.50	.11	.01
Anxiety	5,805	18	-.27	-.32	-.22	-.45	-.07	68.60	75.22	.10	.01
Depression	25,973	55	-.39	-.42	-.37	-.56	-.19	287.74	84.36	.11	.01
Stress	7,705	28	-.32	-.36	-.27	-.47	-.12	127.47	78.82	.12	.01
Suicide Ideation	1,394	3	-.42	-.51	-.31	-.95	.74	8.23	75.71	.09	.01
Mental Disorder	1,517	8	-.35	-.48	-.22	-.70	.14	54.03	87.04	.20	.04

Note: *N* = number of participants; *k* = number of samples; *r* = sample-size-summary observed validity; CI = confidence interval of *r*; PI = prediction interval of *r*; *Q* = Cochran's statistic for variance (or heterogeneity) of effect sizes; *I*² = ratio of true heterogeneity to total variation in the observed samples; τ = Standard deviation in true effects; τ^2 = variance in true effects.

416 For the psychological well-being dimension of positive well-being, we find a meta-
417 analytic correlation of $r = .44$ (95% CI [.40, .48]); the distribution of the ES presented a high
418 level of variation and heterogeneity ($\tau = 0.16$; $\tau^2 = 0.03$; 95% PI [.14, .67]). The summary
419 correlation between dispositional gratitude and other-focused psychological well-being ($r = .47$,
420 95% CI [.39, .54]) did not significantly differ from the one between dispositional gratitude and
421 self-focused psychological well-being ($r = .44$ 95% CI [.36, .50]; $Q(1) = 0.33$, $p = 0.56$). All
422 three indicators of psychological well-being (the composite, other-focused well-being, and self-
423 focused well-being) presented non-negligible levels of variation in their distribution of ESs, with
424 high levels of heterogeneity. Moreover, we did not find a significant difference between the
425 mean ES for dispositional gratitude and subjective well-being, and dispositional gratitude and
426 psychological well-being ($Q(1) = 1.98$, $p = .44$).

427 Regarding negative well-being, the 95% prediction interval ranges from a small (-.10) to
428 a large (-.48) effect size. In addition, the ES of the relationships between dispositional gratitude
429 and each one of the six indicators included in this category (negative affect, anxiety, depression,
430 stress, suicide ideation, and mental disorder) are not statistically the same ($Q(5) = 39.17$, $p <$
431 $.001$). Dispositional gratitude shows the strongest association with depression ($r = -.39$, 95% CI
432 [-.42, -.37]) and suicide ideation ($r = -.42$, 95% CI [-.51, -.31]), and the weakest association with
433 negative affect ($r = -.27$, 95% CI [-.31, -.23]) and anxiety ($r = -.27$, 95% CI [-.32, -.22]). As with
434 the indicators of positive well-being, all the associations between dispositional gratitude and the
435 indicators of negative well-being present non-negligible variations in the distribution of their
436 ESs, along with high levels of heterogeneity.

437 **4.1. Moderator Analysis**

438 Importantly, the calculated ESs between dispositional gratitude and every category,
439 dimension, and indicator of well-being show true variation across studies. Therefore, we employ
440 moderator analyses to better explain the relationships. The first moderator we tested was
441 religiosity (see Table 5). There is no evidence that the mean level of religiosity in a country
442 moderates the relationship between individual dispositional gratitude and well-being, with the
443 exception of depression for which the relationship was weakened. In Table 6, we examine our
444 second moderator: country-level individualistic orientation. We find that the level of
445 individualistic orientation strengthens the association between dispositional gratitude and the
446 following aspects of well-being: positive well-being, subjective well-being, happiness
447 (marginally), life satisfaction, and anxiety. Additionally, the level of individualism weakens the
448 link between dispositional gratitude and negative affect (marginally) and stress (marginally).
449 Although we only found moderating effects of individualistic orientation on half of the examined
450 relationships, the effects were consistently positive on the components of positive well-being.

Table 5. Moderator Analysis: Religiosity

Dependent Variables: Effect Sizes between Dispositional Gratitude and Well-Being's Categories, Dimensions, & Indicators	Predictor: Religiosity					
	β	<i>p</i> -value	95% CI		<i>k</i>	R^2
			L	U		
Positive Well-Being	.021	.77	-.12	.16	117	.00
<i>Subjective Well-Being</i>	.031	.70	-.13	.19	101	.00
Composite	-.043	.81	-.40	.31	21	.00
Happiness	.189	.24	-.13	.50	23	.07
Life Satisfaction	.120	.26	-.09	.34	74	.02
Positive Affect	-.139	.25	-.37	.10	43	.05
<i>Psychological Well-Being</i>	.032	.81	-.24	.24	35	.00
Self-Focused	.136	.54	-.30	.57	18	.03
Other-focused	.250	.32	-.25	.77	14	.06
Negative Well-Being	-.038	.60	-.18	.10	78	.00
Negative Affect	-.061	.64	-.31	.19	36	.01
Anxiety	.086	.45	-.14	.31	13	.11
Depression	-.172	.05	-.35	.00	42	.12
Stress	.017	.91	-.29	.33	25	.00

Note: β = meta-regression coefficient; *p*-value = probability of coefficient different from zero; CI = 95% Confidence Interval for β ; L = Lower Limit; U = Upper Limit; *k* = number of studies included in analysis; R^2 = Proportion of total between-study variance explained by meta-

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Table 6. Moderator Analysis: Individualistic Orientation

Dependent Variables: Effect Sizes between Dispositional Gratitude and Well-Being's Categories, Dimensions, & Indicators	Predictor: Individualistic Orientation					
	β	<i>p</i> -value	95% CI		<i>k</i>	R^2
			L	U		
Positive Well-Being	.001	.04	.00	.00	128	.05
<i>Subjective Well-Being</i>	.001	.02	.00	.00	109	.06
Composite	.000	.71	.00	.00	21	.01
Happiness	.002	.09	.00	.00	25	.12
Life Satisfaction	.003	.00	.00	.01	78	.19
Positive Affect	.001	.38	.00	.00	45	.03
<i>Psychological Well-Being</i>	.000	.83	.00	.00	37	.00
Self-Focused	.001	.52	.00	.00	19	.02
Other-focused	.008	.64	.00	.00	15	.01
Negative Well-Being	-.001	.11	.00	.00	87	.04
Negative Affect	-.002	.08	.00	.00	38	.10
Anxiety	.002	.02	.00	.01	16	.69
Depression	-.001	.23	.00	.00	48	.03
Stress	-.002	.08	-.01	.00	27	.20

Note: β = meta-regression coefficient; *p*-value = probability of coefficient different from zero; CI = 95% Confidence Interval for β ; L = Lower Limit; U = Upper Limit; *k* = number of studies included in analysis; R^2 = Proportion of total between-study variance explained by meta-regression model.

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455 Table 7 displays the moderating effect of sample mean age on the studied relationships.
 456 Older samples present stronger associations between gratitude and subjective well-being (life
 457 satisfaction and positive affect). Interestingly, and opposed to our expectations, we find that
 458 older samples present weaker associations between gratitude and psychological well-being (and
 459 its indicators). Moreover, we find that older samples present weaker associations between
 460 gratitude and negative affect. Thus, we find that the mean age of the samples included in the
 461 analysis moderates almost half of the relationships tested. Participant mean age explained up to
 462 27% of the variability between studies.

463 Table 7. Moderator Analysis: Age

Dependent Variables: Effect Sizes between Dispositional Gratitude and Well-Being's Categories, Dimensions, & Indicators	Predictor: Age					
	β	<i>p</i> -value	95% CI		<i>k</i>	R^2
			L	U		
Positive Well-Being	.001	.82	.00	.00	99	.00
<i>Subjective Well-Being</i>	.003	.07	.00	.01	86	.06
Composite	.004	.15	.00	.00	16	.13
Happiness	.004	.29	.00	.01	17	.07
Life Satisfaction	.004	.02	.00	.01	61	.10
Positive Affect	.032	.05	.00	.01	34	.13
<i>Psychological Well-Being</i>	-.005	.00	-.01	.00	36	.22
Self-Focused	-.006	.02	-.01	.00	27	.16
Other-focused	-.008	.04	-.02	.00	14	.27
Negative Well-Being	-.002	.16	.00	.00	68	.06
Negative Affect	-.004	.04	-.01	.00	29	.18
Anxiety	-.002	.37	-.01	.00	13	.01
Depression	-.001	.69	.00	.00	37	.00
Stress	-.002	.37	-.01	.00	18	.09

Note: β = meta-regression coefficient; *p*-value = probability of coefficient different from zero; CI = 95% Confidence Interval for β ; L = Lower Limit; U = Upper Limit; *k* = number of studies included in analysis; R^2 = Proportion of total between-study variance explained by meta-regression model.

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Table 8. Moderator Analysis: Gender

Dependent Variables: Effect Sizes between Dispositional Gratitude and Well-Being Categories, Dimensions, & Indicators	Predictor: Gender					
	β	<i>p</i> -value	95% CI		<i>k</i>	R^2
			L	U		
Positive Well-Being	.02	.84	-.15	.19	117	.00
<i>Subjective Well-Being</i>	.03	.58	-.16	.22	109	.00
Composite	.13	.73	-.22	.49	22	.03
Happiness	.24	.32	-.23	.71	21	.06
Life Satisfaction	-.06	.50	-.30	.16	80	.00
Positive Affect	.15	.41	-.21	.52	41	.02
<i>Psychological Well-Being</i>	-.01	.97	-.34	.33	37	.01
Composite	.21	.61	-.60	1.02	10	.05
Self-Focused	.33	.22	-.21	.86	19	.08
Other-focused	-.39	.16	-.94	.15	15	.13
Negative Well-Being	-.01	.88	-.18	.16	82	.00
Negative Affect	.21	.32	-.21	.63	34	.02
Anxiety	.18	.24	-.12	.48	16	.12
Depression	.02	.75	-.15	.18	48	.00
Stress	-.16	.28	-.45	.13	23	.05

Note: β = meta-regression coefficient; *p*-value = probability of coefficient different from zero; CI = 95% Confidence Interval for β ; L = Lower Limit; U = Upper Limit; *k* = number of studies included in analysis; R^2 = Proportion of total between-study variance explained by meta-regression model.

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We continue our analysis by testing gender, gratitude measure, sample type. We do not

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find evidence that gender moderates the link between dispositional gratitude and the different

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aspects of the hierarchical structure of well-being (Table 8). As shown in Table 9, for the

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categories and dimensions of well-being, and most of the indicators included in the analysis,

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although most ESs calculated using the GQ-6 are larger than the ones calculated with the other

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measures, except for one association, these ESs are not statistically different from each other.

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The only indicator that shows a statistically significant difference in the use of the GQ-6 is

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happiness. This might be explained by chance. Regarding student samples as a moderator, we

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find that the associations between dispositional gratitude and positive affect and negative affect

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present significantly weaker ESs in student samples compared to non-student samples, while the

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association between dispositional gratitude and other-focused well-being presents a marginally

479 significant, stronger effect size for student samples compared to non-student samples (Table 10).
480 In the case of all other meta-analytic results between dispositional gratitude and every other
481 indicator of well-being, the fact that the studies were conducted on student samples did not
482 significantly moderate the ESs. Finally, we also examined whether each one of the relationships
483 meta-analyzed differed depending on whether the samples included clinical or non-clinical
484 individuals. Table 11 presents these categorical analyses, where clinical samples consistently
485 presented stronger associations between dispositional gratitude and the indicators of well-being,
486 and several of these differences were statistically significant (i.e., subjective well-being, life
487 satisfaction, composite psychological well-being [marginally], negative well-being, stress, and
488 mental disorder).

Table 9. Moderator Analysis: Gratitude Scale Type (GQ-6 vs. Others)

Well-Being: Categories, Dimensions, & Indicators	Q	p-value	k	N	r	95 % CI		τ^2
						L	U	
Positive Well-Being	.54	.46						
GQ-6			106	43,433	.43	.41	.46	.03
Others			32	43,470	.41	.37	.46	.01
<i>Subjective Well-Being</i>	1.56	.21						
GQ-6			91	40,119	.44	.41	.47	.03
Others			29	42,515	.41	.36	.45	.01
Composite	.73	.39						
GQ-6			19	17,154	.46	.38	.54	.05
Others			4	13,968	.38	.19	.54	.04
Happiness	6.14	.01						
GQ-6			20	6,661	.52	.46	.57	.02
Others			7	3,641	.38	.28	.48	.03
Life Satisfaction	.06	.80						
GQ-6			64	20,826	.44	.41	.47	.03
Others			23	39,582	.43	.38	.48	.00
Positive Affect	.13	.72						
GQ-6			37	13,621	.42	.38	.46	.02
Others			12	17,440	.40	.33	.47	.01
<i>Psychological Well-Being</i>	.38	.54						
GQ-6			34	15,086	.43	.37	.49	.04
Others			9	16,355	.47	.36	.57	.02
Composite	.31	.58						
GQ-6			6	8,437	.48	.35	.59	.04
Others			4	13,245	.42	.24	.57	.03
Self-Focused	2.14	.14						
GQ-6			20	4,566	.41	.33	.49	.03
Others			4	879	.55	.38	.69	.09
Other-focused	.00	.98						
GQ-6			14	2,910	.46	.36	.56	.04
Others			5	3,110	.47	.31	.60	.05
Negative Well-Being	.38	.54						
GQ-6			78	26,846	-.33	-.36	-.30	.01
Others			17	13,925	-.31	-.37	-.25	.02
Negative Affect	1.56	.21						
GQ-6			29	9,627	-.29	-.33	-.24	.02
Others			12	17,440	-.23	-.30	-.15	.01
Anxiety	.21	.65						
GQ-6			16	4,072	-.27	-.33	-.21	.00
Others			2	1,536	-.24	-.37	-.09	.04
Depression	.62	.43						
GQ-6			47	16,339	-.40	-.44	-.36	.01
Others			8	5,838	-.44	-.52	-.35	.02
Stress	.23	.63						
GQ-6			27	7,295	-.31	-.35	-.27	.01
Others			1	410	-.26	-.45	-.05	.00

Note: Q = Cochran's statistic of difference in ES between sub-groups; p-value = probability value of significance test of difference in ES between sub-groups; k = number of samples; N = number of participants; r = sample-size-summary observed validity; CI = confidence interval of r; τ^2 = variance in true effects excluding sampling error variance.

Table 10. Moderator Analysis: Sample Type (Student vs. Non-student)

Well-Being Categories, Dimensions, & Indicators	<i>Q</i>	<i>p</i> -value	<i>k</i>	<i>N</i>	<i>r</i>	95 % CI		τ^2
						L	U	
Positive Well-Being	.09	.76						
General			59	61,256	.43	.39	.46	.02
Students			75	28,564	.43	.40	.46	.02
<i>Subjective Well-Being</i>	.54	.46						
General			53	58,397	.44	.41	.48	.02
Students			64	23,493	.42	.39	.46	.02
Composite	.27	.61						
General			11	21,909	.42	.28	.54	.09
Students			11	9,101	.46	.33	.58	.02
Happiness	.14	.71						
General			11	6,519	.50	.41	.57	.03
Students			16	3,783	.48	.40	.54	.03
Life Satisfaction	.00	.98						
General			44	48,369	.44	.40	.47	.01
Students			41	11,406	.44	.40	.47	.03
Positive Affect	11.05	.00						
General			21	22,730	.47	.43	.51	.00
Students			28	8,331	.37	.33	.41	.02
<i>Psychological Well-Being</i>	3.92	.06						
General			22	24,822	.39	.32	.46	.03
Students			20	6,507	.49	.42	.55	.02
Composite	.27	.61						
General			7	21,077	.44	.34	.54	.02
Students			3	605	.49	.34	.62	.00
Self-Focused	1.90	.17						
General			14	3,158	.39	.29	.48	.03
Students			9	2,287	.49	.38	.59	.05
Other-focused	3.06	.08						
General			8	1,636	.38	.24	.50	.07
Students			10	4,384	.51	.42	.59	.02
Negative Well-Being	1.41	.24						
General			41	19,606	-.35	-.38	-.31	.01
Students			51	21,165	-.32	-.35	-.28	.01
Negative Affect	6.21	.01						
General			17	19,890	-.33	-.39	-.27	.02
Students			23	7,177	-.23	-.28	-.17	.01
Anxiety	.27	.60						
General			6	1,476	-.29	-.38	-.19	.00
Students			11	4,132	-.26	-.32	-.19	.01
Depression	.00	.99						
General			19	8,874	-.40	-.45	-.34	.01
Students			34	15,698	-.39	-.43	-.35	.02
Stress	.00	.99						
General			14	4,175	-.31	-.36	-.25	.01
Students			13	3,530	-.31	-.37	-.25	.01
Mental Disorder	1.42	.23						
General			5	947	-.42	-.57	-.24	.05
Students			3	570	-.24	-.46	.01	.03

Note: *Q* = Cochran's statistic of difference in ES between sub-groups; *p*-value = probability value of significance test of difference in ES between sub-groups; *k* = number of samples; *N* = number of participants; *r* = sample-size-summary observed validity; CI = confidence interval of *r*; τ^2 = variance in true effects excluding sampling error variance.

Table 11. Moderator Analysis: Sample Type (Non-clinical vs. Clinical)

Well-Being Categories, Dimensions, & Indicators	<i>Q</i>	<i>p</i> -value	<i>k</i>	<i>N</i>	<i>r</i>	95 % CI		τ^2
						L	U	
Positive Well-Being	2.38	.12						
Non-Clinical			125	88,546	.42	.40	.45	.02
Clinical			12	1,218	.49	.41	.56	.03
<i>Subjective Well-Being</i>	7.04	.01						
Non-Clinical			109	81,558	.42	.40	.45	.02
Clinical			10	964	.54	.46	.62	.04
Happiness	2.30	.13						
Non-Clinical			24	9,954	.47	.42	.52	.03
Clinical			3	348	.59	.44	.71	.00
Life Satisfaction	14.43	.00						
Non-Clinical			74	59,608	.42	.40	.45	.01
Clinical			9	800	.58	.51	.64	.05
Positive Affect	1.33	.25						
Non-Clinical			40	30,299	.41	.37	.44	.01
Clinical			7	762	.46	.37	.55	.01
<i>Psychological Well-Being</i>	.01	.92						
Non-Clinical			34	30,747	.44	.39	.49	.03
Clinical			5	582	.44	.29	.56	.06
Composite	2.87	.09						
Non-Clinical			9	21,612	.48	.39	.56	.02
Clinical			1	70	.18	-.18	.51	.00
Self-Focused	.01	.92						
Non-Clinical			18	5,097	.43	.35	.51	.04
Clinical			3	348	.44	.22	.62	.04
Other-focused	.07	.80						
Non-Clinical			14	5,672	.46	.37	.54	.04
Clinical			2	348	.49	.24	.69	.10
Negative Well-Being	4.70	.03						
Non-Clinical			74	41,086	-.34	-.29	.00	.01
Clinical			17	2,445	-.44	-.33	.00	.02
Negative Affect	1.06	.30						
Non-Clinical			34	26,377	-.26	-.30	-.22	.01
Clinical			6	690	-.32	-.42	-.21	.01
Anxiety	.32	.57						
Non-Clinical			14	5,318	-.26	-.32	-.21	.01
Clinical			3	290	-.31	-.45	-.15	.00
Depression	1.20	.27						
Non-Clinical			42	20,865	-.38	-.42	-.35	.01
Clinical			10	1,312	-.43	-.50	-.35	.01
Stress	6.04	.01						
Non-Clinical			20	6,158	-.28	-.32	-.23	.01
Clinical			7	1,547	-.39	-.46	-.31	.02
Mental Disorder	15.30	.00						
Non-Clinical			6	1,351	-.26	-.36	-.14	.02
Clinical			2	166	-.65	-.76	-.50	.00

Note: *Q* = Cochran's statistic of difference in ES between sub-groups; *p* -value = probability value of significance test of difference in ES between sub-groups; *k* = number of samples; *N* = number of participants; *r* = sample-size-summary observed validity; CI = confidence interval of *r*; τ^2 = variance in true effects excluding sampling error variance.

496 **5. Discussion**

497 Results suggest dispositional gratitude is moderately related to all aspects of well-being.
498 The theoretical and empirical structure of well-being developed in this quantitative review offers
499 a comprehensive approach to personal well-being, excluding physical health. This well-being
500 taxonomy contains indicators, dimensions (composite measures of indicators), and categories
501 (composite measures of indicators or dimensions). Our results present a few differences in the
502 relationship between dispositional gratitude and the different components of well-being,
503 suggesting that each functions in unique ways.

504 Our findings suggest the grateful disposition is more strongly related to positive
505 compared to negative aspects of well-being, which implies grateful individuals (compared to less
506 grateful individuals) present higher levels of subjective and psychological well-being (such as
507 happiness, life satisfaction, or self-focused psychological well-being), compared to their levels of
508 psychological maladjustment (such as depression, anxiety, or stress). Within the positive well-
509 being category, the effect sizes between dispositional gratitude and each subjective and
510 psychological well-being did not differ significantly. This suggests grateful individuals
511 experience equally strong hedonic and eudaimonic forms of well-being. Moreover, these results
512 suggest dispositional gratitude plays an equally important role in hedonic well-being as in all
513 aspects of Aristotle's 'good life' thesis (i.e., living to one's fullest potential, in accordance with
514 virtue or excellence). For the subjective well-being dimension, the cognitive aspect of this
515 dimension (happiness and life satisfaction) and the affective aspect (positive affect) are not
516 statistically different from one another. For the psychological well-being dimension, we did not
517 find a difference between the associations of gratitude and other-focused or self-focused
518 psychological well-being. We also observed differences between the effect sizes among the
519 indicators of negative well-being: depression presented stronger associations with the grateful

520 disposition than the other indicators (i.e. anxiety and stress). This finding warrants further
521 examination in order to understand the reasons behind it. Gratitude might be a strong buffer for
522 more severe mental health conditions.

523 The difference in the magnitude of effect sizes among the different associations studied
524 suggests gratitude may have different effects on the different categories, dimensions, and
525 indicators of well-being. Given that previous meta-analytic studies on gratitude interventions
526 find positive effects on participant well-being via increasing gratefulness (Davies et al., 2016;
527 Dickens, 2017), we suggest future research should empirically examine characteristics of
528 gratitude interventions, as they relate to the effectiveness of such interventions. It will be useful
529 to understand whether interventions should target aspects of well-being that are more strongly
530 correlated with dispositional gratitude (e.g. depression instead of stress, or happiness instead of
531 positive affect). Second, it is necessary to continue evaluating the effect of gratitude
532 interventions on the participants' baseline levels of dispositional gratitude over the long term;
533 presumably, the treatment would have a larger effect on the selected well-being indicator if it
534 effectively cultivates the participants' gratefulness (e.g., Roberts et al., 2017; Watkins, 2004), but
535 to the best of our knowledge this hypothesis has yet to be tested.

536 Although we imply a causal association between dispositional gratitude and well-being,
537 we recognize the present meta-analytical review is correlational in nature. This is true of a large
538 portion of well-being studies, especially the ones focusing on subjective well-being (Diener,
539 Eunkook, Lucas, & Smith, 1999). In addition, we recognize statistical power as a limitation of
540 some of the meta-analyses and moderator analyses conducted. As such, we encourage
541 researchers to conduct more studies exploring the relationships with the smallest number of
542 studies and the largest prediction intervals (i.e. more heterogeneous). In this way, our meta-
543 analytic study could be replicated in the future to improve our assessment of the relationship

544 between dispositional gratitude and different components of well-being. Finally, analyses of
545 publication bias indicate the magnitude of the summary effect for each category, dimension, and
546 indicator captured is a relatively unbiased estimate.

547 **Religiosity.** Previous research suggests a connection between gratitude and religion (e.g.
548 Rosmarin et al., 2011). Notably, although dispositional gratitude is highly regarded in most
549 world religions (Emmons, 2004), each country's overall religiosity level did not moderate the
550 relationship between gratitude and well-being, with the exception of depression (which may be
551 attributable to chance). This finding does not mean religiosity is irrelevant to the relationship
552 between gratitude and well-being. Rather, our finding may be due to the level of analysis used to
553 examine religiosity. In fact, an important limitation of our test is that we used country-level
554 religiosity, as opposed to sample-level religiosity (over 90% of studies did not report religiosity).
555 Given the body of research demonstrating significant relationships between religiosity and
556 various indicators of well-being at the sample-level (e.g., Aghababaei, 2018; Fatima, Sharif, &
557 Khalid, 2018; Jackson & Bergeman, 2011), there exists a clear a priori rationale for inferring that
558 religiosity may moderate the relationships of interest in the current meta-analytic review. Future
559 empirical assessments of gratitude should include direct examinations of religiosity at the
560 individual level to better understand its impact on the relationship between gratitude and well-
561 being.

562 **Individualistic orientation.** As expected, a country's level of individualism positively
563 strengthened the relationship between dispositional gratitude and some aspects of positive well-
564 being. There were not any systematic directions for the relationships between dispositional
565 gratitude and negative well-being. With a few exceptions (e.g., Cohen 2006; Lin, 2014), cultural
566 variables are rarely studied in examinations of the relationship between gratitude and well-being.
567 Importantly, we used country-level individualistic orientation because we were not able to

568 extract the level of individualistic orientation directly from each study. Thus, we cannot make
569 any definitive conclusions about individualistic orientation as a moderator. This is a limitation of
570 our study that should be addressed in future research. Nonetheless, given the non-negligible
571 moderating effects of individualistic orientation obtained in the current meta-analysis, we
572 recommend future research should continue exploring the moderating role of cultural variables in
573 the link between gratitude and well-being, at various levels of analysis.

574 **Age.** The mean age of participants in each study moderates the relationship between
575 dispositional gratitude and some indicators of well-being such that, as age increases, the
576 relationship becomes stronger for indicators of subjective well-being and weaker for indicators
577 of both negative well-being. Our results oppose previous findings that suggest that the
578 association between dispositional gratitude and subjective well-being does not substantially vary
579 with respect to age (e.g., Chopik, et al., 2018; Hill & Allemand, 2011). This difference between
580 the results in this study and others could also be partly attributable to the current review
581 exploring more indicators of well-being than did previous studies. Theoretically, as individual
582 age they become more concerned with generativity, and generativity can be understood as an
583 extension of gratitude (McAdams and Bauer, 2004). Both should interact to strengthen well-
584 being. Yet, we do not find systematic results. Future research should continue studying the
585 differential role age plays in the various links between dispositional gratitude and well-being
586 indicators, dimensions, and categories. An important methodological limitation of our evaluation
587 is our reliance on the average age of all participants in each individual study rather than the age
588 of each study participant. Because of this limitation, our study provides a conservative view of
589 the influence of age on the relationship under study.

590 **Gender.** We did not find evidence suggesting grateful women may present higher levels
591 of well-being than grateful men. Thus, our results further support the gender similarities

592 hypothesis and corresponding meta-analytic evidence suggesting the differences between men
593 and women for most personality constructs are negligible (Hyde, 2005).

594 **Gratitude measures.** It is also important to note the proliferation of measures of
595 dispositional gratitude over the past few years. We find 11 different measures of trait-gratitude in
596 our review. Future empirical quantitative research should investigate the relative predictive
597 validity of the various measures. Furthermore, and considering that cultural variables have an
598 impact on the link between gratitude and well-being, we suggest conducting quantitative cross-
599 cultural research exploring the dimensionality of the construct.

600 **Sample type.** We did not find evidence suggesting sample type (student vs. general
601 population) systematically moderates the relationships between dispositional gratitude and the
602 outcomes of interest. Student samples present weaker associations between dispositional
603 gratitude and positive and negative affect, and marginally stronger associations for both other-
604 focused and psychological well-being. It is possible these small effects are confounded by the
605 age effect, as undergraduate student samples are typically younger than general populations.
606 Thus, we should not make inferences regarding these results.

607 We also examined whether the relationship between dispositional gratitude and well-
608 being depends upon the clinical status of the participants in the individual studies. The results
609 indicate clinical populations present stronger associations between their levels of dispositional
610 gratitude and several indicators of well-being within both the positive and negative well-being
611 categories (with the exception of the psychological well-being composite which had only one
612 study in the clinical subgroup). Consistent with research suggesting personality traits strongly
613 influence adjustment to chronic disease (Wood & Tarrier, 2010; Algoe & Stanton, 2012), we
614 cautiously suggest dispositional gratitude is likely more influential for the well-being of clinical
615 or medical populations than the well-being of general or non-clinical populations. We suggest it

616 may be fruitful for practitioners and researchers to continue investigating the effectiveness of
617 gratitude interventions for clinical populations, as these populations may derive greater benefit
618 from such interventions (e.g. Geraghty, Wood, & Hyland, 2010; Sirosis & Wood, 2017).

619 **6. Conclusion**

620 The individual-level relationship between dispositional gratitude and well-being is
621 foundational to the gratitude literature, and this meta-analytic review provides insights regarding
622 this important relationship. Our work contributes to the emerging gratitude literature, where
623 dispositional gratitude plays a foundational role and well-being is one of the most important
624 outcomes. We clarify the magnitude of the associations between dispositional gratitude and
625 several indicators and categories of well-being. We also examine the role of several potential
626 moderators on the relationships meta-analyzed, and find that clinical samples present stronger
627 associations than non-clinical samples, individualistic orientation positively moderates some of
628 the associations examined, and sample age strengthens the association between gratitude and
629 subjective well-being and weakens the association between gratitude and psychological and
630 negative well-being. The relationships between gratitude and measures of well-being were
631 neither consistently nor significantly moderated by the type of dispositional gratitude measure,
632 religiosity, gender, or samples based on student populations. Our work also advances the
633 personality and well-being literature; we find dispositional gratitude is a predictor of well-being.
634 Finally, we contribute to the well-being literature by developing a comprehensive theoretical
635 hierarchical structure of well-being.

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*** All studies from articles with an asterisk were meta-analyzed. All studies included in the meta-analyses can be found in a reference list in the supplementary materials.**

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Supplementary Materials 1. Studies coded and included in meta-analytic review

Study	N	Publicat. Type	Sample Characteristics			Positive Well-Being Outcomes	95% CI			Negative Well-Being Outcomes	95% CI		
			Country	Female	Type		r	L	U		r	L	U
Salvador-Ferrer (2017)	309	Journal	Spain	75%	Student	SWL	-0.19	-0.30	-0.08	-	-	-	-
Sharma (2015)	140	Thesis	U.S.A.	100%	-	PA	-0.08	-0.24	0.09	Stress, Depression, NA	-0.24	-0.39	-0.08
Lau & Cheng (2017)	101	Journal	China	82%	General	Social support	0.05	-0.15	0.24	Depression, Stress	-0.08	-0.27	0.12
Lambert, Fincham, & Stillman (2012) [3]	753	Journal	U.S.A.	75%	Student	PA	0.09	0.02	0.16	Depression	-0.24	-0.31	-0.17
Smith (2007)	142	Thesis	U.S.A.	14%	General	SWL	0.13	-0.04	0.29	-	-	-	-
Hoy, Suldo, & Mendez (2013) [Women]	137	Journal	U.S.A.	-	General	SWL	0.13	-0.04	0.29	-	-	-	-
Puente-Díaz & Meixueiro	1025	Journal	Mexico	-	General	SWL	0.14	0.08	0.20	-	-	-	-
Shimai, Otake, Park, Peterson, & Seligman (2006) [2]	245	Journal	Japan	-	Student	Happiness	0.16	0.04	0.28	-	-	-	-
Sun & Kong (2013)	354	Journal	China	64%	Student	SWL, PA	0.16	0.05	0.26	NA	-0.18	-0.28	-0.08
Wood, Maltby, Gillett, Linley, & Joseph (2008) [1]	156	Journal	U.S.A.	51%	Student	Social Support	0.17	0.01	0.32	Depression, Stress	-0.24	-0.38	-0.09
Ruini & Vescovelli (2013)	70	Journal	Italy	100%	Clinical	Eudaimonic WB	0.18	-0.05	0.40	Depression, Anxiety	-0.38	-0.57	-0.16
Chen, Wu, & Chang (2017)	190	Journal	Taiwan	48%	Student	SWL	0.18	0.04	0.31	-	-	-	-
Kong, Ding, & Zhao (2015)	427	Journal	China	63%	Student	SWL	0.19	0.10	0.28	-	-	-	-
Boazman (2011)	213	Thesis	U.S.A.	56%	Student	Hedonic WB, PA	0.21	0.08	0.34	NA	-0.25	-0.37	-0.12
Adler & Fagley (2005)	420	Journal	U.S.A.	64%	General	SWL, PA	0.22	0.13	0.31	NA	-	-	-
McGee, Zhao, Myers, & Kim (2017)	36	Journal	U.S.A.	61%	Clinical	Life Meaning, SWL	0.22	-0.12	0.51	Depression, Anxiety	-0.26	-0.54	0.08
Geng (2018)	365	Journal	China	49%	Student	SWL, PA	0.22	0.12	0.32	NA	-0.18	-0.28	-0.08
Shimai, Otake, Park, Peterson, & Seligman (2006) [1]	789	Journal	U.S.A.	-	General	Happiness	0.22	0.15	0.29	-	-	-	-
Zhang, Mou, Tong, & Wu (2018)	468	Journal	China	58%	Student	Life Meaning	0.25	0.16	0.33	Depression, Anxiety, Stress	-0.32	-0.40	-0.24
Althaus, Borasio, & Bernard (2018)	64	Journal	Switzerland	53%	Clinical	Growth	0.25	0.00	0.47	Depression, Anxiety	-0.27	-0.49	-0.03
Perveen, Mehmood, & Yasin (2017)	230	Journal	Pakistan	59%	Student	SWL	0.26	0.14	0.38	-	-	-	-
Hoffman (2016)	38	Thesis	U.S.A.	-	Clinical	SWL	0.27	-0.05	0.54	Depression	-0.69	-0.83	-0.47

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well-Being Outcomes	r	95% CI		Negative Well-Being Outcomes	r	95% CI	
			Country	Female	Type			L	U			L	U
Jiang, Sun, & Liu (2016)	764	Journal	China	66%	Student	SWL, PA	0.28	0.21	0.34	NA	-0.13	-0.20	-0.06
Fagley (2012)	249	Journal	U.S.A.	62%	Student	SWL	0.28	0.16	0.39	-	-	-	-
Peterson, Ruch, Beermann, Park, & Seligman (2007) [2]	445	Journal	Switzerland	61%	Student	SWL, Hedonic WB, Eudaimonic WB	0.28	0.20	0.37	-	-	-	-
Dinh (2016)	608	Thesis	Australia	68%	Student	PA	0.29	0.22	0.36	NA, Anxiety	-0.12	-0.20	-0.04
Joseph, Maltby, Wood, Stockton, Hunt, & Regel (2012)	360	Journal	UK	-	General	Hedonic WB, Growth	0.30	0.20	0.39	-	-	-	-
Samson, Proyer, Ceschi, Pedrini, & Ruch (2011)	196	Journal	Swiss	55%	General	SWL, Happiness	0.31	0.17	0.43	-	-	-	-
Bernard (2017)	100	Thesis	U.S.A.	55%	Student	SWL, PA, Growth	0.31	0.12	0.47	NA, Stress, Mental Health, Anxiety, Depression	-0.01	-0.21	0.18
Chen, Chen, Kee, & Tsai (2009)	608	Journal	Taiwan	70%	Student	Happiness	0.31	0.24	0.38	-	-	-	-
Simon (2016)	477	Journal	Philippines	57%	Student	PA	0.31	0.23	0.39	NA, Depression	-0.32	-0.40	-0.23
Alarcón & Rodríguez (2015)	300	Journal	Peru	51%	Student	Happiness	0.32	0.21	0.42	-	-	-	-
Chan (2013)	145	Journal	Hong Kong	83%	General	Hedonic WB, Eudaimonic WB, Engagement, SWL, PA	0.32	0.16	0.46	NA	-0.17	-0.32	-0.01
Sivis-Cetinkaya (2013)	1052	Journal	Turkey	63%	Student	SWL, PA	0.33	0.27	0.38	NA	-0.15	-0.20	-0.09
Jiang, Yue, Lu, Yu, & Zhu (2016)	1200	Journal	China	58%	Student	Hedonic WB	0.33	0.28	0.38	Depression	-0.38	-0.43	-0.33
Buschor, Proyer, & Ruch (2013)	334	Journal	Switzerland	64%	General	SWL, Hedonic WB, Eudaimonic WB, Engagement	0.33	0.23	0.43	-	-	-	-
Proyer, Gander, Wyss, & Ruch (2011)	1087	Journal	Germany, Switzerland, Austria	100%	General	SWL	0.34	0.29	0.39	-	-	-	-
Gander, Proyer, Ruch, & Wyss (2012)	887	Journal	Germany, Switzerland, Austria	100%	General	SWL, Social Support	0.34	0.28	0.39	-	-	-	-

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well-Being Outcomes	r	95% CI		Negative Well-Being Outcomes	r	95% CI	
			Country	Female	Type			L	U			L	U
Tsang, Carpenter, Roberts, Frisch, & Carlisle (2014)	246	Journal	U.S.A.	52%	Student	SWL	0.35	0.24	0.46	-	-	-	-
Breen, Kashdan, Lenser, & Fincham (2010)	140	Journal	U.S.A.	81%	Student	SWL, Acceptance	0.35	0.20	0.49	Stress, Depression	-0.25	-0.40	-0.09
Chung (2008)	223	Thesis	U.S.A.	73%	Student	SWL	0.35	0.23	0.46	-	-	-	-
Yue, Hiranandani, Jiang, Hou, & Chen (2017) [2]	3198	Journal	China	100%	Student	Hedonic WB	0.35	0.32	0.38	Depression	-0.38	-0.41	-0.35
Cuthbert (2017)	78	Dissertation	U.S.A.	59%	General	Hedonic WB, SWL, Social support	0.36	0.15	0.54	-	-	-	-
Chen, Wu, & Chen (2015)	44	Journal	Taiwan	57%	Student	SWL	0.36	0.07	0.59	-	-	-	-
Yue, Hiranandani, Jiang, Hou, & Chen (2017) [1]	2180	Journal	China	0%	Student	Hedonic WB	0.38	0.34	0.42	Depression	-0.22	-0.26	-0.18
Ruch, Martinez-Marti, Proyer, Harzer (2014)	211	Journal	Germany, Switzerland, Austria	84%	General	SWL	0.38	0.26	0.49	-	-	-	-
Jackson, van de Vijver, & Fouche (2014)	227	Journal	South Africa	68%	Student	SWL	0.39	0.27	0.50	-	-	-	-
Spence, Brown, Keeping, & Lian (2014) [2]	104	Journal	U.S.A.	44%	General	PA	0.39	0.21	0.54	-	-	-	-
Datu & Mateo (2015)	409	Journal	Philippines	58%	Student	SWL, Life Meaning	0.39	0.31	0.47	-	-	-	-
Gavian (2012)	247	Thesis	U.S.A.	70%	Student	Hedonic WB, SWL, PA	0.40	0.29	0.50	NA, Stress, Depression, Anxiety	-0.40	-0.50	-0.29
Gurel & Kirgiz (2008)	86	Thesis	U.S.A.	80%	Student	Hedonic WB, SWL, Happiness, PA	0.40	0.20	0.56	NA	-0.36	-0.53	-0.16
Watkins, Woodward, Stone, & Kolts (2003) [5]	157	Journal	U.S.A.	-	Student	PA, Happiness	0.40	0.26	0.52	NA	-0.51	-0.62	-0.38
O' Leary, Dockray, & Hammond (2016)	87	Journal	9 countries	100%	Clinical	SWL, PA	0.40	0.21	0.56	NA	-0.07	-0.27	0.15
Lane (2009)	222	Thesis	U.S.A.	37%	General	Life Meaning	0.40	0.28	0.51	-	-	-	-
Littman-Ovadia & Lavy (2012)	184	Journal	Israel	60%	General	SWL, PA	0.40	0.30	0.49	NA	-0.22	-0.35	-0.08
Scheidle (2011)	66	Thesis	U.S.A.	80%	General	SWL, PA, Hedonic WB	0.40	0.18	0.59	NA, Mental Health	-0.14	-0.37	0.10

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well-Being Outcomes	95% CI			Negative Well-Being Outcomes	r	95% CI		
			Country	Female	Type		L	U	r			L	U	
Kruger (2011)	113	Journal	South Africa	78%	Student	SWL	0.41	0.24	0.55	-	-	-	-	
Park, Peterson, & Seligman (2004) [2]	852	Journal	U.S.A.	70%	General	SWL	0.41	0.35	0.46	-	-	-	-	
Park, Peterson, & Seligman (2004) [3]	540	Journal	U.S.A.	70%	General	SWL	0.41	0.34	0.48	-	-	-	-	
Lambert, Fincham, & Stillman (2012) [4]	261	Journal	U.S.A.	88%	Student	SWL	0.41	0.30	0.51	Depression	-0.40	-0.50	-0.29	
Ruch, Proyer, Harzer, Park, Peterson, & Seligman (2010)	1674	Journal	Germany, Switzerland, Austria	53%	General	SWL, Happiness	0.41	0.37	0.47	-	-	-	-	
Wood, Joseph, & Maltby (2008)	201	Journal	U.S.A.	64%	Student	Eudaimonic WB	0.41	0.29	0.52	-	-	-	-	
Peterson, Ruch, Beermann, Park, & Seligman (2007) [1]	12439	Journal	U.S.A.	71%	General	SWL, Hedonic WB, Eudaimonic WB	0.42	0.40	0.43	-	-	-	-	
LaBelle & Edelstein (2018)	184	Journal	U.S.A.	60%	Clinical	Growth, Social support	0.42	0.29	0.53	Anxiety, Stress	-0.35	-0.47	-0.22	
Park, Peterson, & Seligman (2004) [1]	3907	Journal	U.S.A.	70%	General	SWL	0.43	0.40	0.46	-	-	-	-	
Watkins, Woodward, Stone, & Kolts (2003) [1]	57	Journal	U.S.A.	-	Student	SWL, PA	0.43	0.19	0.62	NA, Depression	-0.25	-0.48	0.01	
Chopik, Newton, Ryan, Kashdan, & Jarden (2017) [1]	1249	Journal	U.S.A.	57%	General	SWL, PA	0.44	0.40	0.49	Stress, Depression	-0.33	-0.38	-0.28	
Lin (2014)	504	Journal	U.S.A.	65%	Student	SWL, PA	0.44	0.36	0.50	-	-	-	-	
Sun, Jiang, Chu, & Qian (2014)	782	Journal	China	59%	Student	SWL, PA, Positive Relations	0.44	0.38	0.50	NA	-0.31	-0.37	-0.25	
Zhang, Howell, & Stolarski (2013)	496	Journal	U.S.A.	67%	General	SWL, PA, Happiness	0.44	0.37	0.51	NA	-0.41	-0.48	-0.33	
Robustelli & Whisman (2018)	945	Journal	U.S.A. &	47%	General	SWL	0.45	0.40	0.50	-	-	-	-	
Chopik, Newton, Ryan, Kashdan, & Jarden (2017) [2]	15102	Journal	U.S.A.	72%	General	SWL, PA	0.45	0.43	0.46	Depression, NA	-0.26	-0.29	-0.24	
Macaskill & Denovan (2014)	214	Journal	UK	79%	Student	SWL, PA	0.45	0.33	0.55	Mental Health, NA	-0.14	-0.27	-0.01	
Datu (2014)	210	Journal	Philippines	63%	Student	SWL, Happiness	0.45	0.33	0.55	-	-	-	-	

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well- Being Outcomes	r	95% CI		Negative Well- Being Outcomes	r	95% CI	
			Country	Female	Type			L	U			L	U
Kashdan & Breen (2007)	144	Journal	U.S.A.	79%	Student	PA	0.45	0.31	0.57	NA, Depression	-0.32	-0.46	-0.17
Rey (2010)	206	Thesis	U.S.A.	54%	Student	SWL	0.45	0.33	0.55	-	-	-	-
Wood, Joseph, & Maltby (2008)	389	Journal	U.S.A.	-	General	SWL	0.45	0.37	0.53	-	-	-	-
Wood, Maltby, Gillett, Linley, & Joseph (2008) [2]	87	Journal	U.S.A.	86%	Student	Social support	0.45	0.26	0.60	Depression, Stress	-0.45	-0.60	-0.27
McCullough, Emmons, & Tsang (2002) [1]	238	Journal	U.S.A.	73%	Student	SWL, Happiness, PA	0.45	0.34	0.55	Anxiety, Depression, NA	-0.27	-0.38	-0.15
Chen, Chen, & Tsai (2012) [2]	233	Journal	China	62%	Student	Happiness	0.46	0.35	0.56	Depression	-0.34	-0.45	-0.22
Renshaw & Bolognino (2016)	387	Journal	U.S.A.	75%	Student	SWL	0.47	0.39	0.54	-	-	-	-
Eaton, Bradley, & Morrissey (2014) [2]	89	Journal	Australia	78%	Clinical	SWL, PA	0.47	0.28	0.61	NA, Mental Health	-0.43	-0.59	-0.25
Magallares, Recio & Sanjuan (2018)	920	Journal	Spain	69%	General	Life Satisfaction, Positive relations, Autonomy, Environmental Mastery, Personal Growth, Purpose in Life	0.47	0.42	0.52		-	-	-
Hill & Allemand (2011)	962	Journal	Switzerland	-	General	PA, SWL	0.48	0.42	0.52	NA	-0.32	-0.38	-0.26
Noronha & Martins (2016)	186	Journal	Colombia	63%	Student	SWL	0.48	0.36	0.58	-	-	-	-
Spence, Brown, Keeping, & Lian (2014) [1]	119	Journal	U.S.A.	50%	General	PA	0.48	0.33	0.61	NA	-0.60	-0.70	-0.47
Hoy, Suldo, & Mendez (2013) [Men]	107	Journal	U.S.A.	-	General	SWL	0.49	0.33	0.62	-	-	-	-
Disabato, Kashdan, Short, & Jarden (2017)	797	Journal	Various countries		General	Life Meaning	0.49	0.44	0.54	Depression	-0.45	-0.50	-0.39
Szcześniak & Soares (2011)	338	Journal	Italy	68%	General	SWL	0.49	0.40	0.57	-	-	-	-
Washizu & Naito (2015)	179	Journal	Japan	100%	Student	Eudaimonic WB	0.49	0.37	0.59	-	-	-	-
Watkins, Woodward, Stone, & Kolts (2003) [2]	66	Journal	U.S.A.	-	Student	SWL, PA, Happiness	0.50	0.29	0.66	NA, Depression	-0.38	-0.57	-0.16

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well-Being Outcomes	r	95% CI		Negative Well-Being Outcomes	r	95% CI	
			Country	Female	Type			L	U			L	U
Proctor, Linley, & Maltby (2010)	410	Journal	U.S.A.	69%	Student	SWL, PA, Happiness, Acceptance, Positive Relations, Life Meaning	0.50	0.42	0.57	NA, Stress, Depression	-0.27	-0.36	-0.18
Eaton, Bradley, & Morrissey (2014) [1]	161	Journal	Australia	78%	Clinical	SWL, PA	0.50	0.38	0.61	NA	-0.34	-0.47	-0.20
Goodman, Disabato, Kashdan, & Machell (2017)	797	Journal	42 countries	-	General	Hedonic WB, SWL, Happiness, Life Meaning	0.50	0.44	0.55	Depression	-0.45	-0.50	-0.39
Darabi (2018)	216	Thesis	England	67%	General	Life Meaning, SWL, PA	0.50	0.39	0.59	Stress, NA	-0.32	-0.44	-0.20
Greene & McGovern (2017)	350	Journal	U.S.A.	89%	General	Growth, Hedonic WB	0.51	0.43	0.58	Depression	-0.37	-0.46	-0.28
Liu, Gong, Gao, & Zhu (2017)	445	Journal	China	75%	Student	SWL, Hedonic WB	0.51	0.43	0.57	Depression	-0.31	-0.39	-0.22
Rosmarin, Pirutinsky, Cohen, Galler, & Krumrei (2011)	405	Journal	U.S.A.	66%	General	SWL, PA, Happiness	0.51	0.43	0.58	NA, Mental Health	-0.37	-0.45	-0.28
Watkins, Woodward, Stone, & Kolts (2003) [4]	104	Journal	U.S.A.	-	Student	SWL, PA	0.51	0.35	0.64	NA, Depression	-0.56	-0.68	-0.41
Lee (2010)	27	Journal	U.S.A.	22%	General	SWL, Hedonic WB	0.52	0.17	0.75	-	-	-	-
Aghababaei & Tabik (2013)	256	Journal	Iran	49%	Student	SWL	0.52	0.42	0.60	Anxiety, Depression, Mental Health	-0.50	-0.58	-0.40
Miley & Spinella (2006)	154	Journal	U.S.A.	65%	General	SWL	0.52	0.39	0.63	-	-	-	-
Sheridan, Boman, Mergler, & Furlong (2015)	268	Journal	Australia	76%	Student	SWL	0.52	0.43	0.60	Anxiety	-0.28	-0.39	-0.17
Bhullar, Surman, & Schutte (2015)	233	Journal	Australia	62%	Student	SWL, Hedonic WB	0.53	0.43	0.61	Stress	-0.32	-0.43	-0.20
Koenig, Berk, Daher, Pearce, Bellinger, Robins, & King (2014)	112	Journal	U.S.A.	80%	General	Hedonic WB, Positive Relations	0.53	0.38	0.65	Depression	-0.31	-0.47	-0.13
Macaskill (2012)	112	Journal	UK	24%	Clinical	SWL, Happiness, PA	0.53	0.38	0.65	NA	-0.39	-0.54	-0.22

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well-Being Outcomes	95% CI			Negative Well-Being Outcomes	95% CI		
			Country	Female	Type		r	L	U		r	L	U
Jones, You, & Furlong (2013)	528	Journal	U.S.A.	75%	Student	Hedonic WB	0.53	0.47	0.59	-	-	-	-
McCullough, Emmons, & Tsang (2002) [2]	1228	Journal	U.S.A.	80%	General	SWL, PA	0.53	0.49	0.57	NA	-0.43	-0.47	-0.38
Morgan, Gulliford, & Kristjánsson (2017)	1599	Journal	UK	52%	General	SWL, PA, Happiness	0.53	0.50	0.57	-	-	-	-
Lambert, Graham, Fincham, & Stillman (2009)	166	Journal	U.S.A.	87%	Student	Life Meaning	0.53	0.41	0.63	-	-	-	-
Langer, Ulloa, Aguilar-Parra, Araya-Veliz, & Brito (2016)	331	Journal	Chile	70%	General	Happiness, PA	0.53	0.45	0.61	Depression, Stress, Anxiety, NA	-0.37	-0.46	-0.27
Leppma, Mnatsakanova, Sarkisian, Scott, Adjeroh, Andrew, Violanti, & McCanlies (2016)	113	Journal	U.S.A.	24%	General	SWL, Growth, Social support	0.54	0.39	0.66	Stress	-0.01	-0.19	0.18
Ziskis (2011)	224	Thesis	U.S.A.	73%	Student	Acceptance, Life Meaning, Growth, Environmental Mastery, Positive Relations	0.54	0.44	0.62	-	-	-	-
Wajsblat (2012)	225	Thesis	U.S.A.	77%	Student	SWL, Pa, Happiness, Eudaimonic WB	0.55	0.45	0.63	NA	-0.05	-0.18	0.08
Coleman, Zawadzki, Heron, Vartanian, & Smyth (2016)	748	Journal	U.S.A.	-	Student	Social support	0.55	0.50	0.60	Stress	-0.35	-0.41	-0.29
O'Connell, O'Shea, & Gallagher (2018)	91	Journal	Ireland	58%	Student	PA, SWL	0.55	0.39	0.68	-	-	-	-
Zhang, Zhang, Yang, & Li (2017)	928	Journal	China	24%	Student	Social Support	0.56	0.51	0.60	Anxiety	-0.36	-0.41	-0.30
Toussaint & Friedman (2009)	72	Journal	U.S.A.	51%	Clinical	SWL, PA, Happiness	0.57	0.39	0.71	-	-	-	-
Wood, Joseph, & Linley (2007) [2]	87	Journal	UK	86%	Student	Happiness	0.57	0.41	0.70	Depression, Stress	-0.55	-0.68	-0.38
Lin (2016)	750	Journal	Taiwan	65%	Student	Hedonic WB, Positive Relations	0.57	0.52	0.62	-	-	-	-

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well-Being Outcomes	95% CI			Negative Well-Being Outcomes	95% CI		
			Country	Female	Type		r	L	U		r	L	U
Wood, Joseph, & Linley (2007) [1]	149	Journal	UK	77%	Student	SWL	0.59	0.47	0.69	Stress	-0.41	-0.54	-0.27
Harbaugh (2015)	164	Thesis	U.S.A.	-	Clinical	Happiness, PA, Social Support	0.59	0.49	0.69	NA, Depression	-0.48	-0.59	-0.36
Lin (2015)	375	Journal	Taiwan	65%	Student	SWL, PA	0.59	0.51	0.65	-	-	-	-
Barnett (2005)	48	Thesis	U.S.A.	88%	General	Hedonic WB, Happiness	0.59	0.37	0.75	Stress	-0.35	-0.58	-0.07
Tucker (2014)	135	Thesis	U.S.A.	76%	Student	SWL, PA, NA, Positive Relations, Life Meaning, Growth, Acceptance, Environmental	0.61	0.50	0.71	NA	-0.26	-0.41	-0.10
Lin (2017)	231	Journal	Taiwan	61%	Student	Hedonic WB	0.62	0.53	0.69	Depression	-0.34	-0.45	-0.22
Harbaugh & Vasey (2014)	160	Journal	U.S.A.	70%	Student	Happiness, PA	0.62	0.51	0.71	Depression, NA	-0.51	-0.61	-0.38
Watkins, Woodward, Stone, & Kolts (2003) [3]	154	Journal	U.S.A.	-	Student	SWL	0.62	0.51	0.71	Depression	-0.56	-0.66	-0.44
Kaplan, Bradley-Geist, Ahmad, Anderson, Hargrove, & Lindsey (2014)	110	Journal	U.S.A.	-	General	PA	0.63	0.50	0.73	NA	-0.36	-0.51	-0.19
Barrett-Cheetham, Williams, & Bednall (2016)	273	Journal	U.S.A.	68%	General	Eudaimonic WB	0.63	0.55	0.70	-	-	-	-
Jun & Jo (2016)	241	Journal	South Korea	90%	Student	Happiness	0.64	0.55	0.71				
Disabato, Goodman, Kashdan, Short, & Jarden (2015)	7617	Journal	109 countries	79%	General	Hedonic WB, Eudaimonic WB	0.64	0.62	0.65	-	-	-	-
Jun (2016)	241	Journal	Korea	90%	Student	Happiness	0.64	0.55	0.71	-	-	-	-
Eaton, Bradley, & Morrissey (2014) [3]	77	Journal	Australia	78%	Clinical	SWL, PA	0.64	0.49	0.76	NA, Mental Health	-0.59	-0.72	-0.42
Méndez, Desfilis, Barradas, & Valero (2014)	27	Journal	Spain	85%	General	Eudaimonic WB	0.64	0.35	0.82	-	-	-	-
Lin (2015a)	235	Journal	Taiwan	62%	Student	Flourishing	0.65	0.57	0.72	Depression	-0.31	-0.42	-0.19

Table (continued)

Study	N	Publicat. Type	Sample Characteristics			Positive Well- Being Outcomes	95% CI			Negative Well- Being Outcomes	95% CI		
			Country	Female	Type		r	L	U		r	L	U
Lin (2015c)	235	Journal	China	62%	Student	Hedonic WB	0.65	0.57	0.72	Depression	-0.31	-0.42	-0.19
Bietra (2015)	128	Thesis	U.S.A.	53%	Clinical	SWL, Growth	0.70	0.60	0.78	-	-	-	-
Bryan, Young, Lucas, & Quist (2018)	352	Journal	U.S.A.	44%	-	-	-	-	-	Depressive symptoms	-0.46	-0.54	-0.37
Collings (2016)	649	Thesis	Australia	79%	General	-	-	-	-	Depression, Anxiety, Stress	-0.35	-0.42	-0.28
Fenollar Batallar (2012)	48	Thesis	U.S.A.	-	General	-	-	-	-	Depression	-0.41	-0.62	-0.14
Fitch-Martin (2016)	316	Thesis	U.S.A.	-	Student	-	-	-	-	Stress, Depression, Anxiety	-0.26	-0.36	-0.15
Kleiman, Adams, Kashdan, & Riskind (2013)	369	Journal	U.S.A.	85%	Student	-	-	-	-	Depression, Suicide Ideation	-0.36	-0.44	-0.26
Krysinska, Lester, Lyke, & Corveleyn (2015)	165	Journal	U.S.A.	75%	Student	-	-	-	-	Suicide Ideation	-0.39	-0.51	-0.25
Lambert, Fincham, & Stillman (2012) [2]	739	Journal	U.S.A.	70%	Student	-	-	-	-	Depression	-0.21	-0.28	-0.14
Lee, Kim, Bae, Kim, Shin, Yoon, & Kim (2018)	464	Journal	South Korea	0%	General	-	-	-	-	Stress, Anxiety, Depression	-0.47	-0.54	-0.39
Lies, Mellor, & Hong (2014)	310	Journal	Indonesia	42%	General	-	-	-	-	Stress, Mental Health	-0.25	-0.35	-0.14
Lin (2015d)	860	Journal	Taiwan	65%	Student	-	-	-	-	Depression, Suicide Ideation	-0.42	-0.47	-0.36
Maher (2015)	206	Thesis	Australia	79%	General	-	-	-	-	Anxiety, Depression	-0.32	-0.44	-0.19
Mathews & Green (2010)	164	Journal	U.S.A.	71%	Student	-	-	-	-	Anxiety	-0.15	-0.30	0.00
Mills, Redwine, Wilson, Pung, Chinh, Greenberg, & Chopra (2015)	186	Journal	U.S.A.	5%	Clinical	-	-	-	-	Depression, Stress	-0.48	-0.58	-0.36
Petrocchi & Couyoumdjian (2016)	539	Journal	Italy	61%	Student	-	-	-	-	Anxiety, Depression	-0.41	-0.47	-0.33
Rosmarin, Pirutinsky, Greer, & Korbman (2016)	122	Journal	U.S.A.	-	Clinical	-	-	-	-	Depression, Stress	-0.26	-0.42	-0.09
Sirois & Wood (2017) [1]	144	Journal	Canada	78%	Clinical	-	-	-	-	Depression, Stress	-0.49	-0.61	-0.35

Table (continued)

Study	<i>N</i>	Publicat. Type	Sample Characteristics			Positive Well- Being Outcomes	<i>r</i>	95% CI		Negative Well- Being Outcomes	<i>r</i>	95% CI	
			Country	Female	Type			L	U			L	U
Sirois & Wood (2017) [2]	163	Journal	Canada	92%	Clinical	-	-	-	-	Depression, Stress	-0.49	-0.59	-0.36
Van Dusen, Tiamiyu, Kashdan, & Elhai (2015)	389	Journal	U.S.A.	75%	Clinical	-	-	-	-	Depression, Stress	-0.34	-0.43	-0.25
Vieselmeyer, Holguin, & Mezulis (2017)	359	Journal	U.S.A.	-	Clinical	-	-	-	-	Stress	-0.20	-0.30	-0.10

Note: Articles are ordered by the magnitude of their overall effect size with positive well-being (from small to large); *N* = number of participants; Gender: Percentage of women in sample; Type: Student = Student sample, Clinical = Clinical sample, General = Non-clinical and non-student sample; 95% CI = 95% Confidence Interval; L = Lower Limit; U = Upper Limit; SWL = Satisfaction with life; PA = Positive affect; NA = Negative affect.

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Supplementary Materials 2. Categorization of Well-being

Table. Categorization of Well-being: Definitions and Measures

Category	
<i>Dimension</i>	
Indicator Measure	Definition and Representative Measures
Positive Well-Being	
<i>Subjective Well-Being</i>	
Life Satisfaction	<p>Definition: Global assessment of a person's quality of life according to his or her chosen criteria (Shin & Johnson, 1978).</p> <p>Representative Measures: Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985); Brief Multidimensional Students' Life Satisfaction Scale (BMSLSS; Seligson, Huebner, & Valois, 2003); Single item measures of Life Satisfaction.</p>
Positive Affect	<p>Definition: General assessment of the extent to which a "person feels enthusiastic, active, and alert" (Watson, Tellegen, & Clark, 1985, p. 1063).</p> <p>Representative Measure: PANAS-Positive Affect (Watson, Tellegen, & Clark, 1988).</p>
Composite Subjective (hedonic) Well-being, or Happiness	<p>Definition: Assessment of a person's overall subjective or hedonic well-being (Dittmar, Bond, Hurst, & Kasser, 2014), or Subjective Happiness (Lyubomirsky & Lepper, 1999).</p> <p>Representative Measures: Subjective Happiness Scale (Lyubomirsky & Lepper, 1999); Personal Well-Being Index (Cummings, 1998); Orientations to Happiness Scale - Life of Pleasure dimension (Peterson, Park, & Seligman, 2005); Inventory of Well-Being (Lin, 2011); Single item measures of well-being or happiness.</p>
<i>Psychological Well-Being</i>	
Composite psychological (eudaimonic) well-being	<p>Definition: Global assessment of an individual's congruence between life activities and deeply held values, and level of engagement in life (Waterman, 1993).</p> <p>Representative Measures: Psychological Well-Being Scale (Ryff, 1989); Orientations to Happiness Scale - Life of Meaning & Life of Engagement dimensions (Peterson, Park, & Seligman, 2005); World Health Organisation Health Quality of Life-Brief scale - Psychological Health dimension (Murphy, Herrman, Hawthorne, Pinzone, & Evert, 2000).</p>
<i>Self-Focused</i>	
Self-Acceptance	<p>Definition: Assessment of a person's "positive evaluations of oneself and one's past life" (Ryff & Keyes, 1995, p. 720).</p> <p>Representative Measures: Psychological Well-Being Scale - Self-Acceptance dimension (Ryff, 1989); Single item measures of self-acceptance.</p>

Category	
<i>Dimension</i>	
Indicator Measure	Definition and Representative Measures
Autonomy	<p>Definition: Assessment of an individual's "a sense of self-determination" (Ryff & Keyes, 1995, p. 720).</p> <p>Representative Measures: Psychological Well-Being Scale - Autonomy dimension (Ryff, 1989); Single item measures of autonomy or self-determination.</p>
Environmental Mastery	<p>Definition: Assessment of the "capacity to manage effectively one's life and surrounding world" (Ryff & Keyes, 1995, p. 720).</p> <p>Representative Measure: Psychological Well-Being Scale - Environmental Mastery dimension (Ryff, 1989).</p>
Purpose in Life	<p>Definition: Assessment of "the belief that one's life is purposeful and meaningful" (Ryff & Keyes, 1995, p. 720).</p> <p>Representative Measures: Psychological Well-Being Scale - Purpose in Life dimension (Ryff, 1989); Single item measures of life purpose.</p>
Personal Growth	<p>Definition: Assessment of an individual's "sense of continued growth and development" (Ryff & Keyes, 1995, p. 720).</p> <p>Representative Measures: Psychological Well-Being Scale - Personal Growth dimension (Ryff, 1989); Flourishing Scale (FS; Diener et al., 2010); Single item measures of personal growth and development.</p>
<i>Other-Focused</i>	
Positive Relations with Others	<p>Definition: General assessment of a person's "quality relations with others" (Ryff & Keyes, 1995, p. 720).</p> <p>Representative Measures: Psychological Well-Being Scale - Positive Relations with Others dimension (Ryff, 1989); Interpersonal Support Evaluation List (Cohen et al., 1983); Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988); Single item measures of quality of relations with others.</p>
Negative Well-Being	
Negative Affect	<p>Definition: General assessment of a person's unpleasurable engagement and subjective distress (Watson, Tellegen, & Clark, 1988).</p> <p>Representative Measure: PANAS-Negative Affect (Watson, Tellegen, & Clark, 1988).</p>
Depression	<p>Definition: Assessment of the manifestations or symptoms (e.g. behavioral, cognitive, somatic) of depression (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).</p> <p>Representative Measures: Beck Depression Inventory (BDI-I&II; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Beck, Steer, & Brown, 1996); Center for Epidemiological Studies - Depression Scale (CES-D; Radloff, 1977); The Reynolds Depression Screening Inventory (RDSI; Reynolds & Kobak, 1998); Patient Health Questionnaire (PHQ; Kroenke, Spitzer, & Williams, 2003); Brief Symptoms Inventory - Depression (BSI; Derogatis & Spencer, 1982); Single item measures of depression.</p>

Category	
<i>Dimension</i>	
Indicator Measure	Definition and Representative Measures
Anxiety	<p>Definition: Assessment of the manifestations or symptoms (e.g. behavioral, cognitive, somatic) of anxiety.</p> <p>Representative Measures: State-Trait Inventory for Cognitive and Somatic Anxiety (Ree, French, MacLeod, & Locke, 2008); Generalized Anxiety Disorder-7 (GAD-7; Spitzer, Kroenke, Williams, & Swinson, 2006); Brief Symptoms Inventory - Anxiety (BSI; Derogatis & Spencer, 1982); Hospital Anxiety and Depression Scale - Anxiety (HADS; Zigmond & Snaith, 1983); Single item measures of anxiety.</p>
Stress	<p>Definition: Assessment of the symptoms of tension or stress (Lovibond & Lovibond, 1995).</p> <p>Representative Measures: Perceived Stress Scale (Cohen & Williamson, 1988); Post-Traumatic Disorder Checklist - Civilian (PCL; Weathers, Huska, & Keane, 1994); Single item measures of stress.</p>
Suicide Ideation	<p>Definition: Assessment of an individual's preoccupation with suicide.</p> <p>Representative Measures: The Hopelessness Depression Symptom Questionnaire-Suicidality Subscale (HDSQ-SS; Metalsky & Joiner, 1997); Positive and Negative Suicide Ideation Scale (PANSI; Osman, Gutierrez, Kopper, Barrios & Chiros, 1998); Beck Suicide Scale (BSS; Beck & Steer, 1991); Single item measures of suicide ideation.</p>
Composite & Other Negative Indicators	<p>Definition: Composite or global assessment of mental health outcomes other than depression, anxiety, stress, and suicide ideation.</p> <p>Representative Measures: General Health Questionnaire (Goldberg & Williams, 1988); Post-traumatic Cognitions Inventory (PTCI; Foa, Ehlers, Clark, Tolin, & Orsillo, 1999); Post-traumatic Disorder Checklist - Specific (PCL-S; Weathers, Huska, & Keane, 1991).</p>
Related Well-Being	
Optimism	<p>Definition: Measures that assess dispositional optimism.</p> <p>Representative Measures: Life Orientation Test - Revised (LOT-R; Scheier, Carver, & Bridges, 1994); Learned Optimism Test (Seligman, 1991); Single item measures of optimism.</p>
Vitality	<p>Definition: Measures that assess a person's enthusiasm, energy, and aliveness, that represents the connection of physical and Psychological Well-Being (Ryan & Frederick, 1997).</p> <p>Representative Measures: Subjective Vitality Scale (Ryan & Frederick, 1997); Behavioral Activation for Depression Scale - Activation Subscale (BADS; Kanter et al., 2007).</p>
Self-esteem	<p>Definition: Measures that assess a person's global positive and negative attitudes about the self (Rosenberg, 1965).</p> <p>Representative Measures: The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965); Single item measures of self-esteem.</p>

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Supplementary Materials 3. Comparison of the Strength of Personality Traits and Indicators of Well-Being

When comparing the meta-analytic associations between the grateful disposition and subjective well-being in the current study with DeNeve and Cooper's (1998) meta-analytic findings associating 137 personality traits with subjective well-being, the mean correlation between dispositional gratitude and well-being in the current study presents a stronger mean meta-analytic correlation ($r = .42$, 95% CI [.40, .45]) than the correlations in the DeNeve and Cooper (1998) meta-analysis, though there is some overlap in the confidence intervals of the mean correlation in the current study with the four traits that present the strongest associations reported by DeNeve and Cooper: "repressive defensiveness obtained the strongest absolute correlation with SWB, with $r = -.40$ [95% CI [-.49, -.31]], based on four independent samples... [followed by] trust ($r = .37$) [95% CI [.23, .51]], emotional stability ($r = .36$) [95% CI [.28, .44]], [...] desire for control ($r = .34$) [95% CI [.26, .42]] [...]" (p. 216). In sum, dispositional gratitude ranks as one the strongest personality predictors of overall subjective well-being.

Steel and his colleagues (2008) conducted an important systematic review on the relationship between personality, using primarily the Big Five factors as independent variables, and different indicators of subjective well-being, concluding that "the results not only indicate that personality is substantially related to SWB [subjective well-being] but also that the relationship is typically much stronger than previously thought" (p. 152). Comparing our results with the results obtained by Steel and colleagues (2008), dispositional gratitude represents the best trait predictor of happiness and life satisfaction along with extraversion and neuroticism, and the best predictor of positive affect along with extraversion (see Figures A, B, C, and D).

Our work contributes to the broader literature studying the relationship between personality and well-being. Personality is one of the best predictors of subjective well-being (e.g., DeNeve & Cooper, 1998; Ozer & Benet-Martinez, 2006; Steel et al., 2008) and psychological well-being (Schmutte & Ryff, 1997). We expected the relationship between dispositional gratitude and well-being to be as strong as the relationship between other personality traits and well-being, yet, our finding that dispositional gratitude is one of the strongest personality predictors (if not *the* strongest predictor) of well-being underscores the importance of the current work for research and practice.

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Figure A. Meta-analytic Correlations Between Personality Traits and Happiness

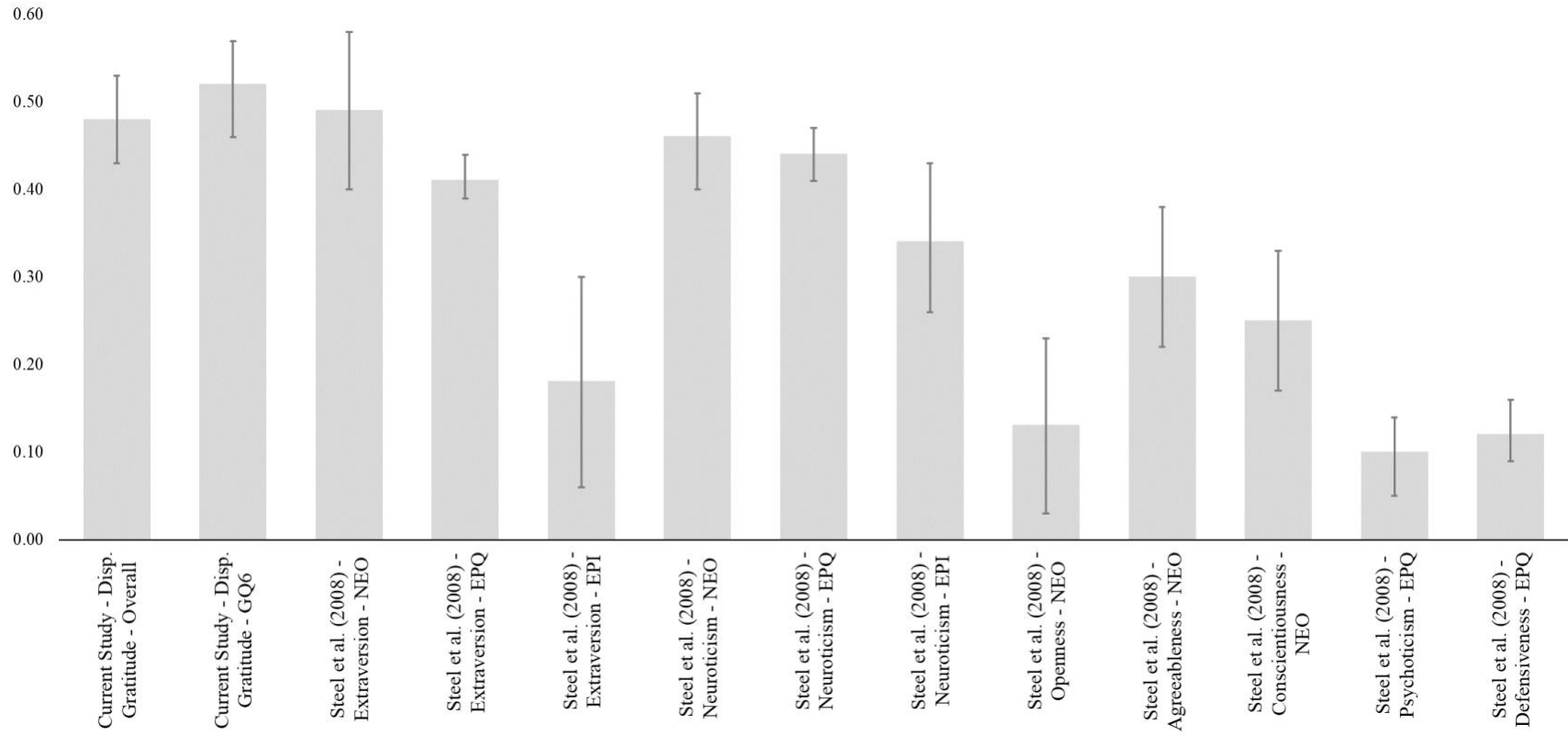


Figure B. Meta-analytic Correlations Between Personality Traits and Satisfaction with Life

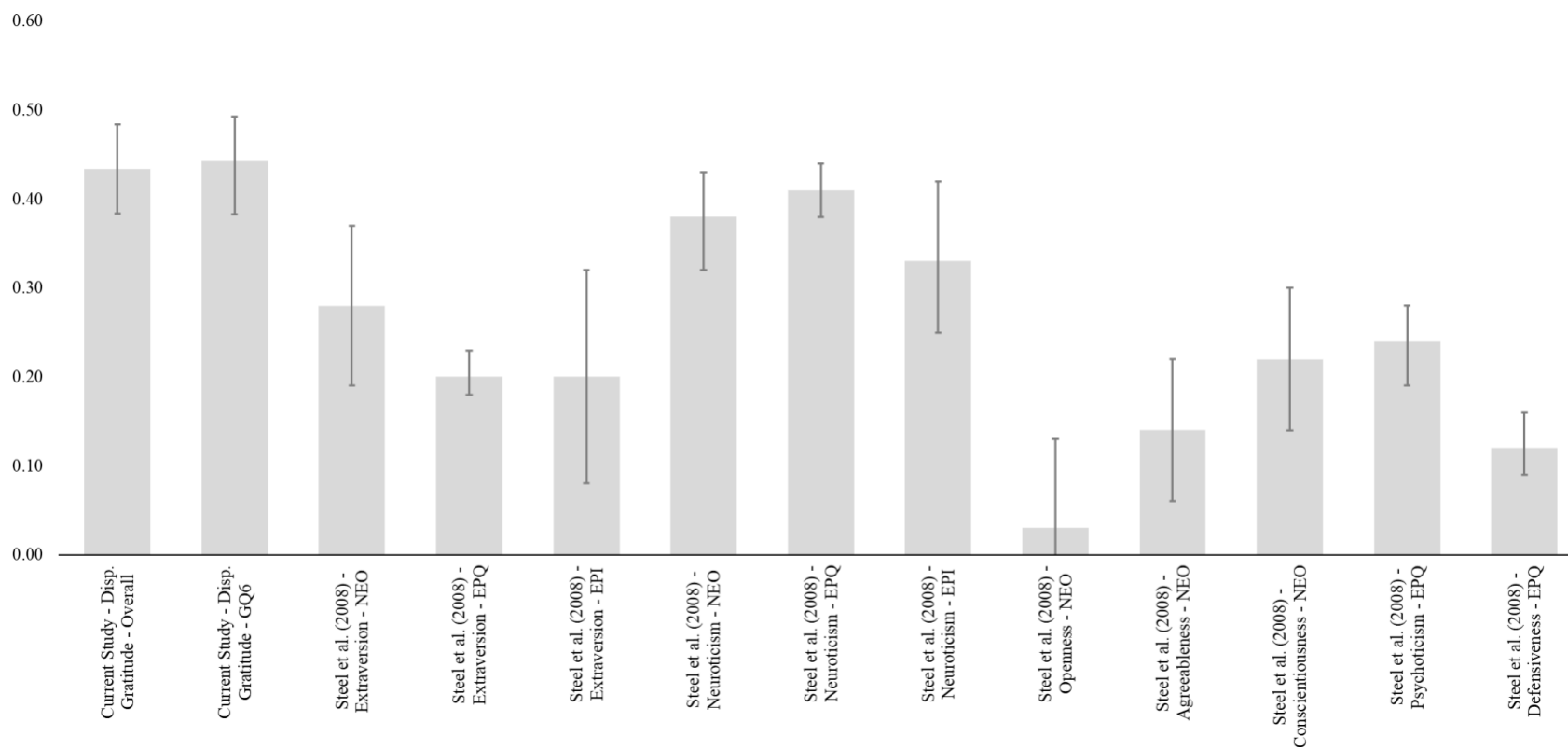


Figure C. Meta-analytic Correlations Between Personality Traits and Positive Affect

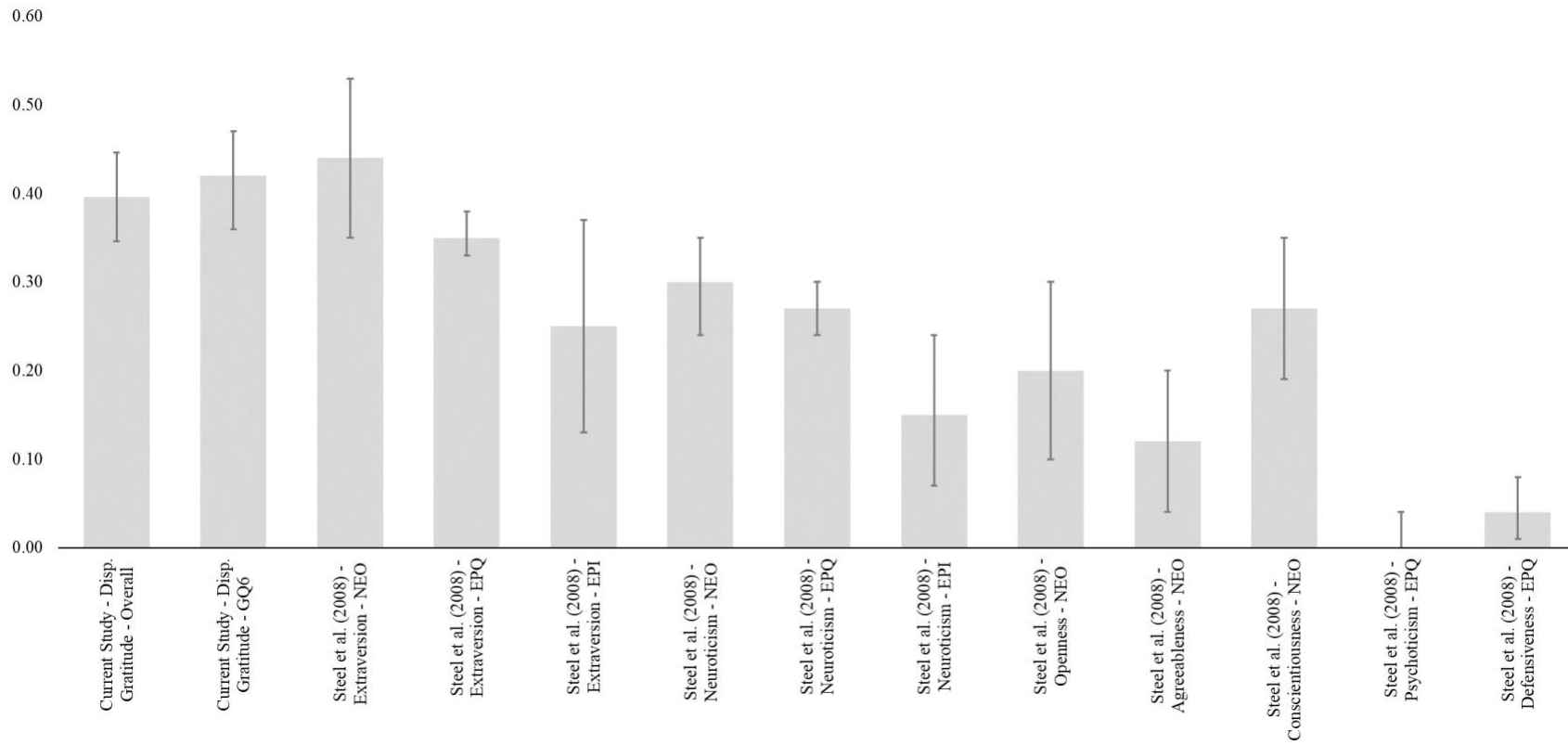
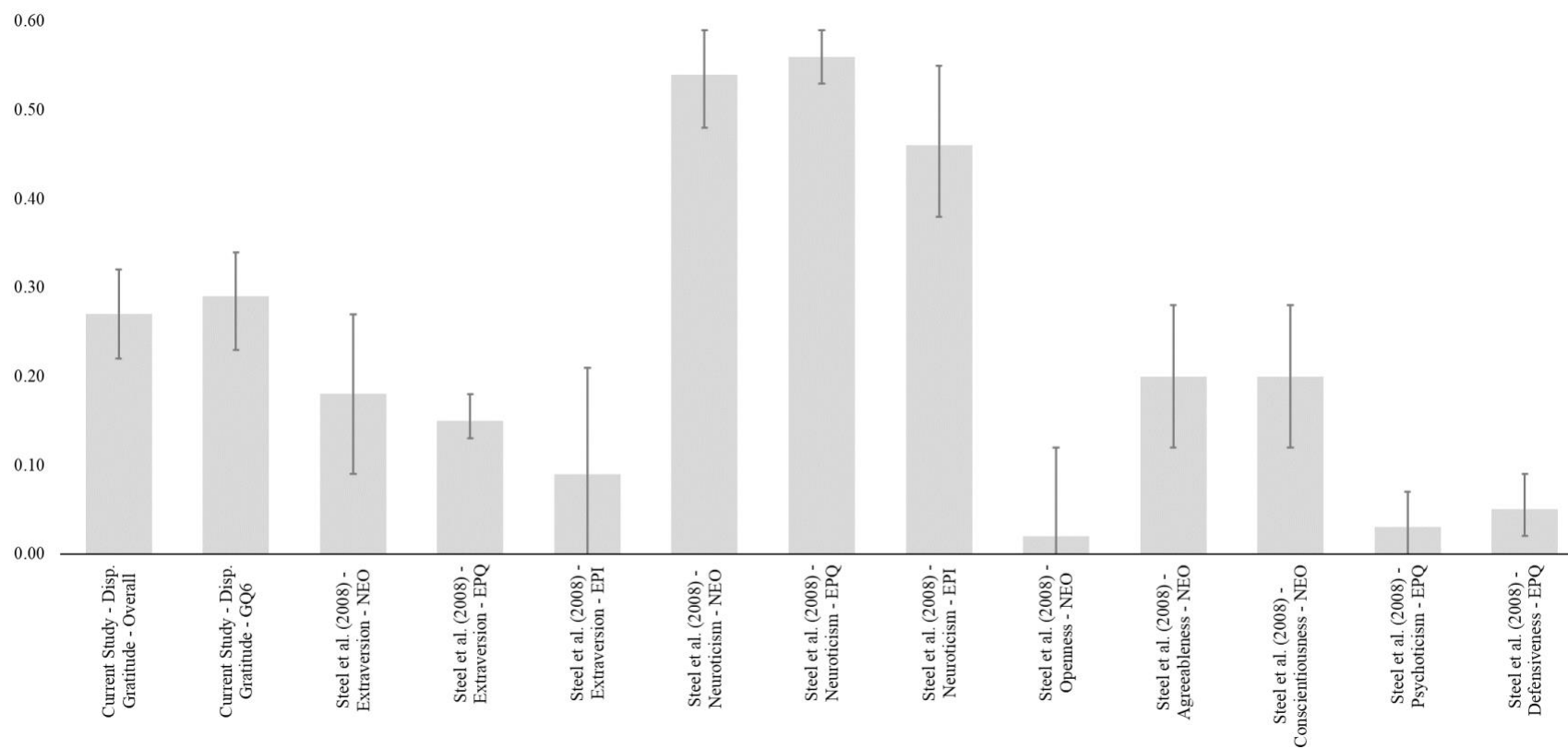


Figure D. Meta-analytic Correlations Between Personality Traits and Negative Affect



Supplementary Materials 4. Publication Bias Assessment

Although we tried to minimize the possible effects of publication bias by soliciting unpublished studies, some unpublished research is impossible to obtain. Therefore, it is necessary to examine whether and to what extent the absence of the unpublished work impacts our results. Using three different methods, we examined publication bias in each meta-analyzed relationship with at least ten individual studies and the results of our analyses suggest this type of bias does not meaningfully impact the relationships studied. Table A presents the results of the trim-and-fill procedure, Orwin's fail-safe N , and the meta-regression analysis of sample size on the effects between dispositional gratitude and well-being. We start our analysis of publication bias by examining the symmetry in the distribution of effect sizes using the Duval and Tweedie's trim-and-fill method, a method that "initially trims the asymmetric studies from the right-hand [or left-hand] side to locate the unbiased effect (in an iterative procedure), and then fills the plot by re-inserting the trimmed studies on the right as well as their imputed counterparts to the left the mean effect [or vice versa]" (Borenstein et al., 2014). Most of the results of the trim and fill procedure suggest no studies would need to be added to achieve a statistically symmetrical distribution of effect sizes. On the few effect sizes where this procedure had a significant effect, the change in the trim and fill estimates compared to the random effect correlations do not represent statistical or practical significant changes in ESs (ranging from $r = |.02|$ to $|.04|$).

Furthermore, the Orwin fail-safe N test resulted in large N s, which means we would need to find large sets of studies (from 32 in the case of anxiety to 510 in the case of positive well-being) with mean correlations of 0 to bring the combined correlations under 0.1 (a small effect size). Finally, using meta-regression analysis, we determine that sample size did not have an effect on the relationship between dispositional gratitude and the categories, dimensions, and

indicators of well-being. Taken together, the results of the three publication bias analyses suggest the set of studies used to examine the relationship between dispositional gratitude and positive well-being does not present publication bias.

Table A. Publication Bias Assessment

Well-Being's Categories, <i>Dimensions</i> , & Indicators	<i>k</i>	<i>r</i>	Trim and Fill Procedure			Fail-Safe N	Regression on Sample Size		
			<i>T&F's r</i>	Change	Missing		β	<i>p</i> -value	R^2
Positive Well-Being	138	.42	.40	-.03	23	510	.00	.75	.00
<i>Subjective Well-Being</i>	120	.43	.39	-.04	26	432	.00	.94	.00
Composite	23	.45	.42	-.02	2	79	.00	.62	.01
Happiness	27	.48	.46	-.03	4	110	.00	.71	.00
Life Satisfaction	87	.43	.41	-.03	21	316	.00	.90	.00
Positive Affect	49	.40	.37	-.03	8	170	.00	.75	.01
<i>Psychological Well-Being</i>	43	.44	Unchanged	-	-	206	.00	.21	.04
Composite	10	.46	Unchanged	-	-	53	.00	.07	.33
Self-Focused	24	.44	Unchanged	-	-	81	.00	.79	.00
Other-focused	19	.47	Unchanged	-	-	76	.00	.89	.00
Negative Well-Being	95	-.33	-.31	.02	11	145	.00	.73	.00
Negative Affect	41	-.27	Unchanged	-	-	55	.00	.57	.01
Anxiety	18	-.27	Unchanged	-	-	32	.00	.49	.03
Depression	55	-.39	Unchanged	-	-	135	.00	.28	.03
Stress	28	-.32	Unchanged	-	-	58	.00	.88	.00

Note: *k* = number of studies included in analysis; *r* = sample-size-summary observed validity; *T&F's r* = Trim and Fill's imputed effect size; Change = Difference in effect sizes (*T&F's r* - *r*); Missing = number of missing to locate the unbiased *T&F's r*; Orwin's Fail Safe N = number of studies needed with mean correlation of 0 to bring the combined correlation under .1; β = meta-regression coefficient for sample size on the effect size between dispositional gratitude and well-being; *p*-value = probability of coefficient different from zero; R^2 = Proportion of total between-study variance explained by meta-regression model.