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Perfectionism and the Five-Factor Model of Personality: A Meta-Analytic Review

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Abstract

Over 25 years of research suggests an important link between perfectionism and personality traits included in the five-factor model (FFM). However, inconsistent findings, underpowered studies, and a plethora of perfectionism scales have obscured understanding of how perfectionism fits within the FFM. We addressed these limitations by conducting the first meta-analytic review of the relationships between perfectionism dimensions and FFM traits ($k = 77$, $N = 24{,}789$). Meta-analysis with random effects revealed perfectionistic concerns (socially prescribed perfectionism, concern over mistakes, doubts about actions, and discrepancy) were characterized by neuroticism ($r_c^+ = .50$), low agreeableness ($r_c^+ = -.26$), and low extraversion ($r_c^+ = -.24$); perfectionistic strivings (self-oriented perfectionism, personal standards, and high standards) were characterized by conscientiousness ($r_c^+ = .44$). Additionally, several perfectionism–FFM relationships were moderated by gender, age, and the perfectionism subscale used. Findings complement theory suggesting that perfectionism has neurotic and non-neurotic dimensions. Results also underscore that the (mal)adaptiveness of perfectionistic strivings hinges on instrumentation.

Keywords

perfectionism, personality, five-factor model, Big Five, meta-analysis

Perfectionists strive for flawlessness, have unrealistic standards, and experience intense external and internal pressures to be perfect (Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt & Flett, 1991). Perfectionism is also multidimensional (Hewitt, Flett, Besser, Sherry, & McGee, 2003), and perfectionism dimensions have unique relationships with various forms of psychopathology (Limburg, Watson, Hagger, & Egan, 2017; Smith et al., 2016; Smith et al., 2018). However, a complete understanding of perfectionism requires knowing not only how perfectionism dimensions relate to psychopathology but also how perfectionism dimensions "fit" within comprehensive personality taxonomies, such as the five-factor model (FFM).

Theory suggests broad FFM traits are channeled into narrow surface traits via learning and other influences (McAdams & Pals, 2006; McCrae & Costa, 1997). Thus, situating perfectionism in the context of the FFM may provide insights into the origins of perfectionism (Enns & Cox, 2002). Moreover, understanding how perfectionism relates to FFM traits allows us to gauge similarities between perfectionism dimensions studied by different researchers. Even so, perfectionism's place in the FFM is clouded by inconsistent findings, underpowered studies, and varying terminology. We addressed these limitations by conducting the first empirical synthesis of the relationships between perfectionism dimensions and FFM traits. Our rigorous and comprehensive meta-analytic review also allowed us to test whether these relationships differed depending on gender, age, nationality, year of data collection, and the perfectionism subscale used. Likewise, the large number of studies included allowed us to evaluate the increase in perfectionism over time reported by Curran and Hill (in press), as well as to evaluate potential differences in perfectionism across gender and age.

Multidimensional Perfectionism

The most commonly studied dimensions of perfectionism derive from two scales, both titled the Multidimensional Perfectionism Scale: the Frost FMPS (Frost et al., 1990) and the Hewitt and Flett HFMPS (HFMPS; Hewitt & Flett, 1991). Frost et al.'s (1990) model conceptualizes perfectionism as predominantly self-focused and involves six dimensions: concern over mistakes, doubts about actions, personal

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standards, parental criticism, parental expectations, and organization. *Concern over mistakes* involves a preoccupation with errors to such an extent that one views one's performance as either perfect or worthless. *Doubts about actions* describe uncertainty regarding the quality of one's performance. *Personal standards* refer to setting lofty goals. *Parental criticism* and *parental expectations* typify seeing one's parents as overly judgmental and holding unrealistically high expectations. *Organization* characterizes a preoccupation with precision and neatness. In contrast, Hewitt and Flett's (1991) model conceptualizes perfectionism as having both self-focused and interpersonal components captured by three dimensions: *self-oriented perfectionism* (requiring perfection from the self), *other-oriented perfectionism* (requiring perfection from other people), and *socially prescribed perfectionism* (perceiving other people as requiring perfection of oneself). Several other important conceptualizations of perfectionism also exist. Slaney, Rice, Mobley, Trippi, and Ashby's (2001) Almost Perfect Scale–Revised (APS-R) conceptualizes perfectionism as having adaptive and maladaptive features with three dimensions: *high standards* (striving for excellence), *order* (a preoccupation with organization), and *discrepancy* (a perceived gap between how one is and how one would like to be).

Perfectionistic Concerns, Perfectionistic Strivings, and Other-Oriented Perfectionism

Two factors underlie several perfectionism dimensions: perfectionistic concerns and perfectionistic strivings (Dunkley, Zuroff, & Blankstein, 2003; Stoeber & Otto, 2006). Perfectionistic concerns encompass socially prescribed perfectionism, concern over mistakes, doubts about actions, and discrepancy (Stoeber & Otto, 2006). Perfectionistic strivings encompass self-oriented perfectionism, personal standards, and high standards (Stoeber & Otto, 2006). Nonetheless, perfectionistic concerns and perfectionistic strivings are unable to integrate all perfectionism dimensions, namely, other-oriented perfectionism (Stoeber, 2018). Likewise, some investigators assess perfectionism using composite scores (e.g., Graham et al., 2010). Accordingly, guided by factor analytic findings (Dunkley, Blankstein, & Berg, 2012) and prior meta-analyses (Smith et al., 2018), we categorized combinations of socially prescribed perfectionism, concern over mistakes, doubts about actions, and/or discrepancy as perfectionistic concerns and categorized combinations of self-oriented perfectionism, personal standards, and/or high standards as perfectionistic strivings. Lastly, we considered three of Frost et al.'s (1990) subscales (parental criticism, parental expectations, and organization) and one of Slaney et al.'s (2001) subscales (order) as "correlates of perfectionism." Parental criticism and parental expectations assess developmental antecedents of perfectionism and organization and order are not defining aspects of perfectionism (Frost et al., 1990; Stoeber & Otto, 2006).

The Five-Factor Model of Personality

The five-factor model (FFM) of personality derives from the lexical hypothesis. The lexical hypothesis posits that "individual differences that are most significant in the daily transactions of persons with each other will eventually become encoded in their language" (Goldberg, 1982, p. 204). Specifically, following lexical studies (e.g., Allport & Odbert, 1936; Cattell, 1943) and factor analyses of adjectives (e.g., Goldberg, 1992) and sentences (e.g., Costa & McCrae, 1992), a consensus emerged in support of a model in which five broad factors are sufficient to describe the basic structure of personality (Costa & McCrae, 1992; Digman, 1990; Goldberg, 1992; John & Srivastava, 1999). More recent research has suggested that personality variation is best summarized by a set of six factors (Ashton & Lee, 2007). Even so, the FFM remains the most widely used and researched personality taxonomy and hence provides the basis for our meta-analysis.

Pervin, Cervone, and John (2005) define the FFM's five factors as follows. *Neuroticism* characterizes the tendency to experience negative emotions. Typical adjectives describing neuroticism are moody, nervous, and touchy. *Extraversion* characterizes sensation seeking and the quantity and the intensity of interpersonal relationships. Typical adjectives describing extraversion are sociable, assertive, and energetic. *Openness to experience* characterizes autonomous thinking, a willingness to examine unfamiliar ideas, and an inclination to try new things. Typical adjectives describing openness are inquisitive, philosophical, and innovative. *Agreeableness* characterizes the quality of interpersonal interactions along a continuum from social antagonism to compassion. Typical adjectives describing agreeableness are kind, considerate, and generous. Lastly, *conscientiousness* characterizes a sense of duty, persistence, and self-disciplined goal-directed behavior. Typical adjectives describing conscientiousness are organized, responsible, and efficient.

Perfectionism and the Five-Factor Model

Early theorists emphasized the role of neuroticism in the origins of perfectionism (cf. Enns & Cox, 2002). Alfred Adler (1938) regarded perfectionism as a neurotic form of overcompensation. In Adler's words, perfectionists are "perpetually comparing themselves with the unobtainable idea of perfection, are always possessed and spurred on by a sense of inferiority" (p. 35-36). Alternatively, Karen Horney (1950) regarded perfectionism as a neurotic pursuit of the idealized self, characterized by "the tyranny of the should" (p. 64). Horney noted, "for the neurotic, his best is not good enough

. . . he should have done better" (pp. 69-79). And Albert Ellis (1958) regarded perfectionism as an irrational belief rooted in neuroticism. In Ellis's words,

> the individual comes to believe in some unrealistic, impossible, often perfectionistic goals—especially the goal that he should always be approved by everyone . . . and then, in spite of considerable contradictory evidence, refuses to give up his original illogical beliefs. (pp. 43-44)

In support, perfectionistic concerns are predominantly characterized by neuroticism and to a lesser extent low agreeableness and low extraversion (Dunkley et al., 2012; Hill, McIntire, & Bacharach, 1997; Rice, Ashby, & Slaney, 2007). Nonetheless, consistent with Hamachek (1978), not all perfectionism dimensions involve neuroticism. Perfectionistic strivings are typically characterized by conscientiousness (Hill et al., 1997; Rice et al., 2007), and other-oriented perfectionism is primarily characterized by low agreeableness (Sherry, Hewitt, Flett, Lee-Baggley, & Hall, 2007; Stoeber, 2014). Likewise, although perfectionism dimensions overlap with FFM traits, the explanatory power of perfectionism dimensions beyond FFM traits in predicting important outcomes is well established. For instance, after controlling for variance attributable to FFM traits, perfectionistic concerns, perfectionistic strivings, and other-oriented perfectionism incrementally add to the prediction of disordered personality (Sherry et al., 2007), self-esteem (Rice et al., 2007), and depressive symptoms (Dunkley et al., 2012).

But why do perfectionism dimensions overlap with FFM traits? One possible answer is that perfectionism dimensions arise from a dynamic interplay between FFM traits and the social environment (McAdams & Pals, 2006; McCrae & Costa, 1997). For instance, perfectionistic strivings might arise in childhood due to an interaction between high conscientiousness and intense environmental pressures to excel (Flett, Hewitt, Oliver, & Macdonald, 2002). Alternatively, some scholars maintain that perfectionism is an extreme variant of conscientiousness (Samuel, Riddell, Lynam, Miller, & Widiger, 2012), whereas other scholars maintain that conscientiousness is a source trait that gives rise to surface traits, such as perfectionism (Cattell, 1977; Enns & Cox, 2002).

Advancing Research on Perfectionism–FFM Relationships Using Meta-Analysis

Still, our understanding of how perfectionism fits within the framework of the FFM is limited. First, there are notable inconsistencies in findings, especially for smaller effects. For instance, some studies report self-oriented perfectionism is negatively related to neuroticism (Hewitt & Flett, 2004); some studies report self-oriented perfectionism is unrelated to neuroticism (Campbell & DiPaula, 2002); and other studies report self-oriented perfectionism is positively related to neuroticism (Enns & Cox, 2002). Second, Monte Carlo simulations have shown that observed correlations provide stable estimates of the underlying population correlations only when sample sizes larger than 250 are examined (Schönbrodt & Perugini, 2013). Hence, a sizable portion of the perfectionism–FFM literature is underpowered (see Table 1). A meta-analysis could correct for distorting artifacts that produce the illusion of inconsistent findings (Borenstein, Hedges, Higgins, & Rothstein, 2009). Third, due to limitations of narrative reviews (e.g., Stoeber, Corr, Smith, & Saklofske, 2018), the strength of the relationships between perfectionism dimensions and FFM traits remain to be quantified. A meta-analysis could clarify which perfectionism dimensions display the strongest relationships with FFM traits.

Fourth, the tendency for researchers to adopt different models of perfectionism—and then use the associated instruments' subscales interchangeably—has made understanding the perfectionism–FFM literature challenging. To illustrate, Page, Bruch, and Haase (2008) combined self-oriented perfectionism and personal standards to study perfectionistic strivings and FFM traits and reported that perfectionistic strivings were unrelated to extraversion. In contrast, Ulu and Tezer (2010) used high standards to investigate perfectionistic strivings and FFM traits and reported that perfectionistic strivings were related positively with extraversion. Whether Page et al.'s (2008) and Ulu and Tezer's (2010) findings diverged due to differences between perfectionism subscales, artifacts, or both is unclear. Thus, an incremental advance would arise from a meta-analytic study examining the potential moderating effect of the perfectionism subscale used on perfectionism–FFM relationships.

Indeed, evidence suggests the subscales comprising perfectionistic concerns and the subscales comprising perfectionistic strivings are differentially related to FFM traits. Regarding perfectionistic concerns, Rice et al. (2007) reported that concern over mistakes, doubts about actions, and discrepancy had stronger positive relationships with neuroticism relative to socially prescribed perfectionism. Regarding perfectionistic strivings, the relationship between self-oriented perfectionism and agreeableness is generally negative (Enns & Cox, 2002; Stoeber, Otto, & Dalbert, 2009); the relationship between personal standards and agreeableness is usually non-significant (Enns & Cox, 2002; Rice et al., 2007); and the relationship between high standards and agreeableness is often positive (Clark, Lelchook, & Taylor, 2010; Rice et al., 2007). Similarly, self-oriented perfectionism and personal standards typically display small positive relationships with neuroticism (Rice et al., 2007; Stoeber, 2014), whereas the relationship between high standards and neuroticism is usually non-significant (Clark et al., 2010; Rice et al., 2007).

The Present Study

Against this background, our primary aim was to situate perfectionism dimensions within the framework of the FFM. To date, there is no meta-analysis of this longstanding and important literature. We also aimed to test whether the relationships between perfectionistic concerns and FFM traits, and the relationships between perfectionistic strivings and FFM traits, vary as a function of the perfectionistic concerns subscale used and the perfectionistic strivings subscale used. Such evidence would inform the debated difference between assessing high standards versus perfectionism and why it might matter (see Blasberg, Hewitt, Flett, Sherry, & Chen, 2016). Given a central aim of meta-analyses are to catalyze a search for moderators that may resolve heterogeneity (Borenstein et al., 2009), we also tested the moderating effect of gender, age, nationality, and year of data collection on perfectionism–FFM relationships.

Based on theory and research (Dunkley et al., 2012; Hamachek, 1978; Hill et al., 1997; Rice et al., 2007; Stoeber et al., 2018), we hypothesized that perfectionistic concerns (socially prescribed perfectionism, concern over mistakes, doubts about actions, and discrepancy) are primarily characterized by neuroticism and, to a lesser extent, by low extraversion and low agreeableness. In contrast, we hypothesized that perfectionistic strivings (self-oriented perfectionism, personal standards, and high standards) are primarily characterized by conscientiousness and that other-oriented perfectionism is primarily characterized by low agreeableness. Regarding moderation, we hypothesized that relative to socially prescribed perfectionism, concern over mistakes, doubts about actions, and discrepancy have stronger positive relationships with neuroticism (Rice et al., 2007). Similarly, we hypothesized that relative to high standards, self-oriented perfectionism and personal standards have stronger positive relationships with neuroticism and weaker positive relationships with agreeableness (Enns & Cox, 2002; Rice et al., 2007). Due to insufficient theory and inconsistent findings, our tests of the potential moderating effect of gender, age nationality, and year of data collection on perfectionism–FFM relationships were exploratory.

Our secondary aim was to test potential differences in perfectionism levels across gender, age, and year of data collection. We hypothesized that Curran and Hill's (in press) finding that self-oriented perfectionism, other-oriented perfectionism, and socially prescribed perfectionism have increased linearly over time would replicate. We also expand on Curran and Hill (in press) by testing whether other dimensions of perfectionism (concern over mistakes, doubts about actions, discrepancy, and high standards) have increased linearly over time. Due to inconsistent findings, our tests of potential differences in perfectionism dimensions across gender and age were exploratory.

Method

Selection of Studies

We searched four databases: PsycINFO, PubMed, ERIC, and ProQuest Dissertations and Theses. Each database was searched using the following terms and Boolean operators: *perfection** AND (*big five* OR *big 5* OR *five factor* OR *5 factor* OR *FFM* OR *agreeableness* OR *agreeability* OR *disagreeab** OR *conscientious** OR *unconscientious* OR *disinhibit** OR *impulsive** OR *extraversion* OR *extravert* OR *surgency* OR *introversion* OR *introvert* OR *openness* OR *intellect* OR *imagination* OR *neurotic** OR *emotional*stab** OR *emotional* unstab** OR *emotional* instab** OR *negative affect** OR *positive affect** OR *positive emotional** OR *negative emotional** OR *temperament* OR *trait anxiety* OR *psychoticism* OR *NEO* OR *NEO-PI* OR *NEO-FFI* OR *NEO-PI-R* OR *big five inventory* OR *BFI* OR *Eysenck Personality Questionnaire* OR *EPQ* OR *schedule for nonadaptive and adaptive personality* OR *SNAP* OR *general temperament survey* OR *GTS* OR *positive and negative affect schedule* OR *PANAS** OR *HEXACO* OR *humility*). This search yielded 2,049 studies. The first and the third author evaluated each study for inclusion using the following criteria: (a) the study reported an effect size (e.g., correlation) or sufficient information for computing an effect size; (b) the study was a published journal article, dissertation, book chapter, or manual; and (c) the study assessed one or more FFM trait alongside perfectionism. Studies from any nation and any time period were considered relevant. To locate additional studies, we conducted a backward citation search resulting in the inclusion of one article (Stoeber & Corr, 2015) and one book chapter (Enns & Cox, 2002). On August 9th 2016, we terminated search strategies and started data reduction and analysis. Interrater agreement on inclusion in our meta-analysis was 100%. Perfectionism measures assessed in five or less studies were not analyzed. The final set of included studies comprised 77 studies with 95 samples (see Table 1 and Supplemental Material A). In total, 95 studies were excluded (see Supplemental Material B for justifications).

Coding of Studies

The first and the third author coded each study based on 12 characteristics: nationality, sample size, sample type, publication status, study design, year of publication, mean age of participants, percentage of female participants, percentage of ethnic minority participants, measure used to assess perfectionism, and measure used to assess FFM traits (Table 1).

Meta-Analytic Procedures

Our meta-analysis was conducted using Comprehensive Meta-Analysis (Version 2; Borenstein, Hedges, Higgins, & Rothstein, 2005). We used random-effects models over

fixed-effect models as the 77 included studies varied extensively in design (see Table 1). Furthermore, as imperfect reliability can attenuate the magnitude of observed correlations, we disattenuated effects by dividing each observed correlation by the square root of the product of the two corresponding reliability coefficients. When reported, the actual reliability statistic for a study was used; when not reported, the corresponding meta-analyzed mean reliability was used (Card, 2012). Subsequently, we weighted mean effects following the procedures recommended by Hunter and Schmidt (1990). This allowed for estimation of the mean effect size and the variance in observed scores after considering sample error (Card, 2012). For studies with more than one FFM measure, effects were averaged such that only one effect per FFM trait was included.

To assess moderation, we evaluated the total heterogeneity of weighted mean effects (Q_T). A significant Q_T implies the variance in weighted mean effects is higher than expected by sampling error (Card, 2012). We also evaluated the percentage of total variation across studies attributable to heterogeneity (I^2). Values of I^2 corresponding to 25%, 50%, and 75% reflect low, medium, and high heterogeneity (Card, 2012). Unlike Q_T, I^2 is not influenced by the number of included studies. When Q_T was significant, a categorical structure to the data was stipulated, and the total heterogeneity explained by the categorization (Q_B) calculated. A significant Q_B indicates significant differences in effect sizes between categories and provides a firm basis for moderation (Borenstein et al., 2009). Thus, in the presence of a significant Q_B and adequate content coverage (three or more studies per subgroup; Card, 2012), we investigated differences in the magnitude of effects across studies grouped by nationality, perfectionism subscale, publication status (peer-reviewed journal articles vs. book chapters, manuals, and dissertations), and FFM measure versus non-FFM measure (scales developed to assess FFM personality structure vs. scales not developed to assess FFM personality structure), by performing a series of all possible two-group comparisons to determine which group(s) differed significantly (Card, 2012). For each group comparison, the resultant Q_B was tested using a χ^2 test with one degree of freedom. We also used the common strategy of dividing the Type I error rate ($\alpha = .05$) by the number of comparisons (Card, 2012) to evaluate the significance of Q_B. Studies assessing perfectionism using composite scores were excluded from tests of the moderating effect of perfectionism subscales.

When Q_T was significant, we also performed random-effects meta-regression with restricted maximum likelihood estimation to test the moderating effect of three continuous and two categorical covariates: gender (mean percentage of females), age (mean age), year of data collection (year of publication minus two), perfectionism subscale, and FFM versus non-FFM measure. Specifically, for each observed relationship, we tested six models: a model with gender entered as a predictor, a model with age entered as a predictor, a model with year of data collection entered as a predictor, a model with the perfectionism subscale used entered as a predictor, a model with FFM versus non-FFM measure entered as a predictor, and a model with gender, age, year of data collection, FFM versus non-FFM measure, and the perfectionism subscale used entered simultaneously as predictors. Only continuous moderators evaluated in 10 or more samples and categorical moderators evaluated in three or more samples were considered. When continuous moderators were significant, we computed effect sizes at different levels and provided corresponding scatter plots in our supplemental material. We included the perfectionism subscale used, the year of data collection, and FFM versus non-FFM measure as covariates to adjust for the possibility that changes in perfectionism–FFM relationships are explained by factors other than gender and age.

Publication bias was assessed by comparing published and unpublished studies, inspecting funnel plots with observed and imputed studies, and computing Egger's test of regression to the intercept (Egger, Smith, Schneider, & Minder, 1997). Comparing published studies with unpublished studies allows for tests of whether effects from published studies are larger than effects from unpublished studies. Funnel plots allow for a visual inspection of publication bias. In the absence of publication bias, effects should be distributed symmetrically around the mean. In the presence of publication bias, there should be symmetry at the top of the funnel plot and asymmetry near the bottom of the funnel plot (Borenstein et al., 2009). Likewise, including observed and imputed studies in funnel plots allows for inspection of how effects change when missing studies are imputed (Borenstein et al., 2009). When publication bias is absent, Egger's regression to the intercept does not differ significantly from zero (Egger et al., 1997).

For analyses testing potential differences in perfectionism dimensions across gender, age, and year of data collection, we again performed random-effects meta-regression with restricted maximum likelihood estimation. For each perfectionism dimension, we tested four models: a model with gender entered as a predictor, a model with age entered as a predictor, a model with the year of data collection entered as a predictor, and a model with gender, age, and the year of data collection entered simultaneously as predictors.

Description of Studies

Our search identified 77 studies and 95 samples containing relevant data (Table 1). The number of participants pooled across samples was 24,789. Relevant effects were obtained from 62 peer-reviewed journal articles, 30 dissertations, two book chapters, and one manual. A total of 55 samples contained university students, 18 samples contained community members, nine samples contained psychiatric patients, six samples contained adolescents, two samples contained medical patients, and there was one sample of

(continued)

Table 1. Characteristics of Studies Included in the Meta-Analysis.

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
Albanese-Kotar (2001)	146	Mixed[a]	32.2	60.0	11.0	American	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	NEO-PI-R-C
Békés et al. (2015)	47	Psychiatric[b]	41.5	70.2	25.0	Canadian	Article	Longitudinal	HFMPS-SOP FMPS-PS APS-R-HS	NEO-FFI-N NEO-FFI-C
Bousman (2007), Sample 1	183	University[c,d]	NR	66.0	11.0	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG APS-R-HS APS-R-ORD APS-R-DIS	IPIP-N IPIP-E IPIP-O IPIP-A IPIP-C
Boysan & Kiral (2017)	242	University[d]	21.0	66.9	NR	Turkish	Article	Cross-sectional	FMPS-COM[e] FMPS-DAA[e] FMPS-PC[e] FMPS-PE[e] FMPS-PS[e] FMPS-ORG[e]	BFI-N[f] BFI-E[f] BFI-O[f] BFI-A[f] BFI-C[f]
Brannan (2010)	847	University[c]	20.1	100.0	34.9	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS	NEO-FFI-N
Brannan & Petrie (2008)	398	University[c]	19.7	100.0	34.9	American	Article	Cross-sectional	HFMPS-SOP HFMPS-SPP	NEO-FFI-N
Campbell & DiPaula (2002)	226	University[c]	NR	NR	NR	NR	Book chapter	Cross-sectional	HFMPS-SOP HFMPS-SPP	NEO-FFI-N NEO-FFI-E NEO-FFI-O NEO-FFI-A NEO-FFI-C PANAS-NA
Chang (2009)	197	Medical patient/psychiatric[b]	47.2	72.6	14.2	American	Dissertation	Cross-sectional	APS-R-HS APS-R-ORD APS-R-DIS	PANAS-NA
Chang & Sanna (2012)	243	University[c]	19.6	74.9	35.3	American	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	PANAS-NA
Clark et al. (2010)	323	University[c]	24.0	73.0	49.0	American	Article	Cross-sectional	APS-R-HS APS-R-ORD APS-R-DIS	IPIP-N IPIP-E IPIP-O IPIP-A IPIP-C
Cox et al. (2001)	76	Psychiatric[b]	39.1	65.8	NR	Canadian	Article	Cross-sectional	HFMPS-SOP	NEO-FFI-N NEO-FFI-E
Cumming & Duda (2012)	194	Athletes	16.7	87.1	NR	British	Article	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PS	PANAS-NA

(continued)

Table 1. (continued)

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
Cuttler & Graf (2007)	141	Community[g]	45.6	69.5	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	NEO-PI-R-N NEO-PI-R-E NEO-PI-R-O NEO-PI-R-A NEO-PI-R-C
Davis (1997)	123	Psychiatric[b]	27.8	100.0	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	EPQ-R-N
Davis et al. (2005)	100	University[c]	22.8	0.0	NR	Canadian	Article	Cross-sectional	HFMPS-SOP	EPQ-R-N
Di Biase (1998)	198	University[c]	21.6	66.2	13.0	American	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	NEO-FFI-N
DiPasquale (2012), Sample 1	93	University[c]	19.9	100.0	34.4	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS	NEO-FFI-N
DiPasquale (2012), Sample 2	310	University[c]	20.5	100.0	42.6	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS	NEO-FFI-N
DiPasquale (2012), Sample 3	126	University[c]	20.8	0.0	24.4	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS	NEO-FFI-N
DiPasquale (2012), Sample 4	141	University[c]	21.1	0.0	42.1	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS	NEO-FFI-N
Downey and Chang (2007)	310	University[c]	19.4	100.0	39.0	American	Article	Cross-sectional	HFMPS-SOP HFMPS-SPP	PANAS-NA
Dunkley et al. (2012), Sample 1	357	University[c]	20.0	61.1	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-SPP FMPS-COM FMPS-PS APS-R-HS APS-R-DIS	NEO-PI-R-N NEO-PI-R-E NEO-PI-R-O NEO-PI-R-A NEO-PI-R-C
Dunkley et al. (2012), Sample 2	223	Community[g]	40.1	66.4	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-SPP FMPS-COM FMPS-PS APS-R-HS APS-R-DIS	NEO-PI-R-N NEO-PI-R-E NEO-PI-R-O NEO-PI-R-A NEO-PI-R-C
Egan et al. (2015)	222	University[c]	24.5	56.8	NR	Australian	Article	Cross-sectional	FMPS-COM FMPS-PC FMPS-PE FMPS-PS	IPIP-N IPIP-A

(continued)

Table 1. (continued)

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
Enns & Cox (1999)	145	Psychiatric[b]	43.6	62.1	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG	NEO-FFI-N NEO-FFI-E
Enns & Cox (2002)	281	Psychiatric[b]	41.0	58.0	NR	Canadian	Book chapter	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG	NEO-FFI-N NEO-FFI-E NEO-FFI-O NEO-FFI-A NEO-FFI-C
Enns et al. (2005)	206	University[c]	24.0	44.2	NR	Canadian	Article	Cross-sectional	HFMPS-SF-SOP HFMPS-SF-SPP FMPS-COM FMPS-DAA	NEO-FFI-N
Fee & Tangney (2000)	86	University[c]	21.9	60.0	43.3	American	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	NEO-PI-R-C
Flett et al. (2011)	51	Medical patients	37.7	62.0	NR	Canadian	Article	Cross-sectional	HFMPS-SF-SOP HFMPS-SF-OOP HFMPS-SF-SPP	NEO-PI-R-N
Gainey (2011), Sample 1	374	University[c]	19.0	62.0	15.0	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA	BFI-N BFI-E BFI-O BFI-A BFI-C PANAS-X-NA
Gainey (2011), Sample 2	299	Psychiatric[b]	36.7	73.9	11.0	American	Dissertation	Cross-sectional	FMPS-COM FMPS-DAA	BFI-N BFI-E BFI-O BFI-A BFI-C PANAS-X-NA
Gladstone (2014)	151	Community[g]	NR	70.2	15.2	American	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	BFI-N BFI-E BFI-O BFI-A BFI-C
Graham et al. (2010)	240	University[c]	20.0	83.3	13.3	Canadian	Article	Longitudinal	HFMPS-SPP FMPS-COM FMPS-DAA FMPS-PS	BFI-N
Grialou (2006)	84	Adolescent	NR	67.9	NR	American	Dissertation	Cross-sectional	APS-R-HS APS-R-DIS	IPIP-N IPIP-E IPIP-C

(continued)

Table 1. (continued)

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
Hannah (2011)	91	Community[g]	29.4	63.7	27.5	American	Dissertation	Cross-sectional	APS-R-HS APS-R-DIS	mini-IPIP-N mini-IPIP-E mini-IPIP-O mini-IPIP-A mini-IPIP-C
Hartling (2012), Time 1	138	Community[g]	42.7	NR	NR	Canadian	Dissertation	Longitudinal	HFMPS-SOP	IPIP-N IPIP-C
Hartling (2012), Time 2	138	Community[g]	42.7	NR	NR	Canadian	Dissertation	Longitudinal	HFMPS-SOP	IPIP-N IPIP-C
Hewitt et al. (1991), Sample 1	107	University[c]	21.7	54.2	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	EPQ-N EPQ-E
Hewitt et al. (1991), Sample 2	76	Psychiatric[b]	35.7	61.8	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	EPQ-N EPQ-E
Hewitt & Flett (2004), Sample 1	160	University	NR	50.0	NR	Canadian	Manual	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	NEO-PI-R-N NEO-PI-R-E NEO-PI-R-O NEO-PI-R-A NEO-PI-R-C
Hewitt & Flett (2004), Sample 2	94	University	21.3	80.9	21.3	Canadian	Manual	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	IPIP-N IPIP-E IPIP-O IPIP-A IPIP-C
Hill et al., (1997)	214	University[c]	19.0	70.1	NR	American	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	NEO-PI-R-N NEO-PI-R-E NEO-PI-R-O NEO-PI-R-A NEO-PI-R-C
Kaptein (2007)	263	University[c]	21.4	100.0	31.4	Canadian	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	EPQ-R-N
Kaye et al. (2008)	372	University[c]	21.2	40.3	36.6	American	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG	NEO-FFI-N NEO-FFI-E GTS-NA
Kim et al. (2011)	223	Community	36.4	90.6	17.0	American	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	BFI-N
Kim et al. (2015)	208	University[c]	19.6	72.6	NR	Australian	Article	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG APS-R-HS APS-R-ORD APS-R-DIS	BFI-N BFI-E BFI-O BFI-A BFI-C

(continued)

Table 1. (continued)

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
Klein (2006)	121	University[c]	NR	83.5	24.8	American	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-SPP FMPS-COM FMPS-DAA FMPS-PS	NEO-FFI-N
Latimer-Kern (2009)	399	University[c]	19.7	100.0	35.1	American	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-SPP	NEO-FFI-N
Mackinnon et al. (2011)	200	University[c]	19.9	100.0	12.0	Canadian	Article	Longitudinal	FMPS-SF-COM FMPS-SF-PS	BFI-N
Mackinnon et al. (2012), men	226	University[c]	NR	0.0	11.5	Canadian	Article	Longitudinal	HFMPS-OOP[h] HFMPS-SPP[h] FMPS-COM[h]	BFI-N
Mackinnon et al. (2012), women	226	University[c]	NR	100.0	11.5	Canadian	Article	Longitudinal	HFMPS-OOP[h] HFMPS-SPP[h] FMPS-COM[h]	BFI-N
Magunsson et al. (1996)	121	Nurses	25.0[i]	100.0	NR	British	Article	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG	EPQ-R-SF-N EPQ-R-SF-E
Maloney et al. (2014)	311	Psychiatric[b]	36.3	74.6	NR	Australian	Article	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PE FMPS-PC FMPS-PS	NEO-FFI-N
Mann (1998)	207	University[c,d]	23.9	59.0	41.5	Canadian	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	TBI-N TBI-E TBI-O TBI-A TBI-C
Molnar (2011), Sample 1	538	University	22.4	77.5	NR	Canadian	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	FFM-MM-N FFM-MM-E FFM-MM-C PANAS-NA
Molnar (2011), Sample 2	773	Medical patients	49.0	93.5	NR	Mixed	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	FFM-MM-N FFM-MM-E FFM-MM-C PANAS-NA
Molnar et al. (2006)	492	Community[g]	31.0	60.6	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	PANAS-NA
Mosher (2001), men	119	Community	22.5	0.0	NR	Canadian	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	EPQ-N
Mosher (2001), women	119	Community	20.8	100.0	NR	Canadian	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	EPQ-N
Nathanson et al. (2006), Sample 1	291	University[c]	NR	65.0	57.0	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	BFI-N BFI-E BFI-O BFI-A BFI-C

(continued)

Table 1. (continued)

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
O'Connor and O'Connor (2004)	131	University[c]	21.1	100.0	NR	British	Article	Cross-sectional	HFMPS-SOP HFMPS-SPP	IPIP-C
Ozbilir (2011), Sample 1	153	University[c]	NR	66.9	11.8	Canadian	Dissertation	Cross-sectional	HFMPS-SOP APS-R-HS APS-R-DIS	IPIP-C
Ozbilir (2011), Sample 2	110	University[c]	NR	64.7	NR	Turkish	Dissertation	Cross-sectional	HFMPS-SOP APS-R-HS APS-R-DIS	IPIP-C
Ozbilir et al. (2015), Sample 1	114	Community[g]	NR	68.0	11.8	Turkish	Article	Cross-sectional	APS-R-HS APS-R-DIS	IPIP-C
Ozbilir et al. (2015), Sample 2	155	Community[g]	NR	64.7	NR	Canadian	Article	Cross-sectional	APS-R-HS APS-R-DIS	IPIP-C
Page et al. (2008)	212	University[c]	21.2	56.1	57.0	American	Article	Cross-sectional	HFMPS-SOP HFMPS-SPP FMPS-COM FMPS-DAA FMPS-PS	BFI-N BFI-E BFI-O BFI-A BFI-C
Parker & Stumpf (1995)	587	Adolescents	NR	37.5	13.5	American	Article	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG	NEO-FFI-N NEO-FFI-E NEO-FFI-O NEO-FFI-A NEO-FFI-C
Pollock (2000)	51	Community[g]	21.5	100.0	NR	Mixed	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	EPQ-R-N
Rice et al. (2007), Sample 1	178	University[c]	20.1	56.2	13.0	American	Article	Cross-sectional	APS-R-HS APS-R-ORD APS-R-DIS	NEO-FFI-N NEO-FFI-E NEO-FFI-O NEO-FFI-A NEO-FFI-C
Rice et al. (2007), Sample 2	208	University[c]	19.4	74.0	34.0	American	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP FMPS-COM FMPS-DAA FMPS-PC FMPS-PE FMPS-PS FMPS-ORG APS-HS APS-R-ORD APS-R-DIS	NEO-FFI-N NEO-FFI-E NEO-FFI-O NEO-FFI-A NEO-FFI-C
Rice et al. (2013), men	215	University[c]	18.5	0.0	48.0	American	Article	Cross-sectional	APS-R-HS APS-R-DIS	mini-IPIP-N mini-IPIP-C
Rice et al. (2013), women	232	University[c]	18.5	100.0	48.0	American	Article	Cross-sectional	APS-R-HS APS-R-DIS	mini-IPIP-N mini-IPIP-C
Rice et al. (2014), Sample 2	340	University[c]	19.4	77.6	45.3	American	Article	Cross-sectional	SAPS-HS SAPS-DIS FMPS-COM FMPS-DAA FMPS-PS	mini-IPIP-N mini-IPIP-C

(continued)

Table 1. (continued)

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
Rosser et al. (2003)	61	Psychiatric[b]	31.5	47.5	NR	Australian	Article	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PC	EPQ-N
Schriber et al. (2016), Sample 4	347	Community[g]	38.0	63.0	17.0	NR	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	BFI-A
Sherry & Hall (2009)	566	University[c]	19.5	100.0	9.2	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-SPP	BFI-N
Sherry et al. (2007), Sample 2	350	University[c]	19.1	82.6	NR	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	NEO-FFI-N NEO-FFI-E NEO-FFI-O NEO-FFI-A NEO-FFI-C
Sherry et al. (2010)	1,258	Professors	48.1	38.4	11.3	Mixed	Article	Cross-sectional	HFMPS-SF-SOP HFMPS-SF-SPP	BFI-N BFI-C
Short & Mazmanian (2013)	213	University[c]	25.0	83.1	10.3	Canadian	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	PANAS-NA
Shoss et al. (2015)	154	Community[g]	42.7	45.0	27.0	American	Article	Cross-sectional	HFMPS-SF-OOP	IPIP-C
Shueh (2011)	1,465	University	20.7	66.6	38.6	American	Dissertation	Cross-sectional	APS-R-HS APS-R-DIS	mini-IPIP-N mini-IPIP-E mini-IPIP-O mini-IPIP-A mini-IPIP-C
Smith et al. (2014)	223	University[c]	19.1	49.3	NR	Canadian	Article	Cross-sectional	HFMPS-SF-SPP FMPS-COM FMPS-DAA	FFM-MM-N
Smith, Saklofske, et al. (2017), Sample 1	423	University[c]	18.7	74.8	NR	Canadian	Article	Cross-sectional	HFMPS-SF-SOP HFMPS-SF-SPP FMPS-COM FMPS-DAA FMPS-PS	BFI-N
Smith, Saklofske, et al. (2017), Sample 2	514	University[c]	19.5	81.5	NR	Chinese	Article	Cross-sectional	HFMPS-SF-SOP[j] HFMPS-SF-SPP[j] FMPS-COM[j] FMPS-DAA[j] FMPS-PS[j]	BFI-N[j]
Smith, Speth, et al. (2017)	312	University[c]	20.2	79.2	30.4	Canadian	Article	Cross-sectional	HFMPS-SF-SPP HFMPS-SF-SOP	BFI-N
Soenens et al. (2005), mothers	148	Community[g]	47.7	100.0	0.0	Belgium	Article	Cross-sectional	FMPS-PS[k]	NEO-FFI-N[l]
Soenens et al. (2005), fathers	130	Community[g]	47.7	0.0	0.0	Belgium	Article	Cross-sectional	FMPS-PS[k]	NEO-FF-N[l]
Stoeber (2014), Study 2	326	University[c]	19.9	83.7	NR	British	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	HEXACO-N HEXACO-E HEXACO-O HEXACO-A HEXACO-C
Stoeber & Corr (2015)	388	University[c]	19.8	80.4	32.0	British	Article	Cross-sectional	HFMPS-SOP HFMPS-OOP HFMPS-SPP	PANAS-NA
Stoeber et al. (2009), Time 1	214	Adolescents	16.0	51.1	NR	German	Article	Longitudinal	HFMPS-SOP[m] HFMPS-SPP[m]	NEO-FFI-N[n] NEO-FFI-E[n] NEO-FFI-O[n] NEO-FFI-A[n] NEO-FFI-C[n]

(continued)

Table 1. (continued)

	Sample								Measures	
Study	*N*	Sample type	Mean age	Female %	Ethnic %	Nationality	Status	Design	Perfectionism	Five-factor traits
Stoeber et al. (2009), Time 2	214	Adolescents	15.9	59.3	NR	German	Article	Longitudinal	HFMPS-SOP[m] HFMPS-SPP[m]	NEO-FFI-N[n] NEO-FFI-E[n] NEO-FFI-O[n] NEO-FFI-A[n] NEO-FFI-C[n]
Triesch (2001)	66	Psychiatric[b]	38.7	67.0	14.0	American	Dissertation	Cross-sectional	HFMPS-SPP	EPQ-N
Ulu & Tezer (2010)	604	University[c]	18.2	37.6	NR	Turkish	Article	Cross-sectional	APS-R-HS[o] APS-R-DIS[o]	BFI-N[p] BFI-E[p] BFI-O[p] BFI-A[p] BFI-C[p]
Vergauwe et al. (2015)	201	Community[g]	36.1	58.0	NR	Belgian	Article	Cross-sectional	FMPS-COM FMPS-DAA FMPS-PS[q]	NEO-FFI-N[l] NEO-FFI-E[l] NEO-FFI-O[l] NEO-FFI-A[l] NEO-FFI-C[l]
Zhang (2012)	316	University[c]	22.7	69.6	38.6	American	Dissertation	Cross-sectional	HFMPS-SOP HFMPS-SPP	PANAS-NA

Note. **NR** = not reported; **Ethnic %** = percentage ethnic minority; **HFMPS** = Hewitt and Flett's (1991) Multidimensional Perfectionism Scale; **SOP** = self-oriented perfectionism; **OOP** = other-oriented perfectionism; **SPP** = socially prescribed perfectionism; **NEO** = Neuroticism-Extraversion-Openness; **NEO-PI-R** = Costa and McCrae's (1992) NEO Personality Inventory–Revised; **C** = conscientiousness; **FMPS** = Frost, Marten, Lahart, and Rosenblate's (1990) Multidimensional Perfectionism Scale; **PS** = personal standards; **APS-R** = Slaney, Rice, Mobley, Trippi, and Ashby's (2001) Almost Perfect Scale–Revised; **HS** = high standards; **NEO-FFI** = Costa and McCrae's (1992) NEO–Five-Factor Inventory; **N** = neuroticism; **COM** = concern over mistakes; **DAA** = doubts about actions; **PC** = parental criticism; **PE** = parental expectations; **ORG** = organization; **ORD** = order; **DIS** = discrepancy; **IPIP** = Goldberg's (1999) International Personality Item Pool; **E** = extraversion; **O** = openness to experience; **A** = agreeableness; **BFI** = John and Srivastava's (1999) Big Five Inventory; **PANAS** = Watson, Clark, and Tellegen's (1988) Positive and Negative Affect Schedule; **NA** = negative affect; **EPQ–R** = Eysenck and Eysenck's (1991) Eysenck Personality Questionnaire–Revised; **SF** = short form; **PANAS-X** = Watson and Clark's (1999) Positive and Negative Affect Schedule–Expanded Form; **GTS** = Watson and Clark's (1993) General Temperament Survey; **EPQ** = Eysenck and Eysenck's (1975) Eysenck Personality Questionnaire; **TBI** = Goldberg's (1992) Transparent Bipolar Inventory; **FFM-MM** = Saucier's (1994) Five-Factor Model Mini-Markers; **mini–IPIP** = Donnellan, Oswald, Baird, and Lucas's (2006) Mini International Personality Item Pool; **SAPS** = Rice et al.'s (2014) Short Almost Perfect Scale; **HEXACO** = Lee and Ashton's (2006) HEXACO Personality Inventory–Revised; **BFFM** = Goldberg's (1992) Big Five-Factor Markers.

[a]Sample of undergraduates, law students, medical students, lawyers, and physicians

[b]Psychiatric patients

[c]University undergraduate students

[d]University graduate students

[e]Turkish version of the FMPS (Kağan, 2011) used

[f]Turkish version of the BFI (Evinç, 2004) used

[g]Community adults

[h]Partner-specific short form used

[i]Mean age not reported; median age recorded

[j]Scale translated into Chinese

[k]Scale translated into Dutch

[l]Validated Dutch version of the NEO-FFI (Hoekstra, Ormel, & De Fruyt, 1996) used

[m]German translation of the MPS (Stoeber, 2000) used

[n]German translation of the NEO-FFI (Borkenau & Ostendorf, 1993) used

[o]Turkish version of the APS-R (Ulu, 2007) used

[p]Turkish version of the BFI (Alkan, 2006) used

[q]Validated Dutch version of the FMPS (Soenens, Vansteenkiste, Luyten, Duriez, & Goossens, 2005) was used

psychiatric and medical patients, one sample of athletes, one sample of nurses, one sample of professors, and one sample of students and professionals. There were 86 cross-sectional samples and nine longitudinal samples. Sample size ranged from 47 to 1,465 with a mean of 260.9 (SD = 221.6) and a median of 212. The average percentage of female participants was 67.2%, the average percentage of ethnic minority participants was 25.9%, and the average age of participants was 26.9 years (SD = 9.8; range: 15.4 to 49.0). The average year of data collection was 2006.3 (SD = 6.0; range: 1989-2015; median = 2008). There were 36 Canadian samples, 35 American samples, five British samples, four Australian samples, four Turkish samples, three mixed samples, three Belgian samples, two German samples, one Chinese sample, and two samples that did not report nationality. Effect sizes for each sample are in Supplemental Material C. Effect sizes for each sample disattenuated for unreliability are in Supplemental Material D. Intercorrelations for each sample are in Supplemental Material E. Means and standard deviations for each sample are in Supplemental Material F.

Measures

Perfectionism. Perfectionism was assessed using four self-report measures (see Table 1). Following theory and research (Stoeber & Otto, 2006), we categorized self-oriented perfectionism, personal standards, and high standards as dimensions of perfectionistic strivings. Likewise, we categorized socially prescribed perfectionism, concern over mistakes, doubts about actions, and discrepancy as dimensions of perfectionistic concerns.

Five-Factor Model Traits. FFM traits were assessed using 15 self-report measures (see Table 1). We combined neuroticism with trait negative affect, but not state negative affect (Markon, Krueger, & Watson, 2005). We also calculated effects for neuroticism and trait negative affect separately (Supplemental Material I). Additionally, we tested whether overall effects from scales intended to measure FFM personality structure differed from overall effects from scales not intended to assess FFM personality structure (Supplemental Material J).

Results

Overall Effect Sizes

Overall observed and disattenuated weighted mean effects between perfectionistic concerns, perfectionistic strivings, other-oriented perfectionism, and FFM traits are in Table 2. Overall disattenuated effects between correlates of perfectionism (parental criticism, parental expectations, organization, and order) and FFM traits are in Supplemental Material G. Overall disattenuated effects for intercorrelations among perfectionism dimensions are in Supplemental Material H. We interpret overall disattenuated effects following Gignac and Szodorai's (2016) guidelines for small, moderate, and strong effect sizes (r = .10, .20, and .30).

Results were largely as hypothesized. Neuroticism and conscientiousness exhibited the strongest, most consistent relationships with perfectionism dimensions. Neuroticism had strong positive relationships with doubts about actions (r_c^+ = .63), concern over mistakes (r_c^+ = .53), discrepancy (r_c^+ = .53), perfectionistic concerns (r_c^+ = .50), and socially prescribed perfectionism (r_c^+ = .37), and small positive relationships with self-oriented perfectionism (r_c^+ = .15), other-oriented perfectionism (r_c^+ = .14), perfectionistic strivings (r_c^+ = .13), and personal standards (r_c^+ = .12). Conscientiousness had strong positive relationships with high standards (r_c^+ = .49), perfectionistic strivings (r_c^+ = .44), self-oriented perfectionism (r_c^+ = .42), personal standards (r_c^+ = .40), and a small positive relationship with other-oriented perfectionism (r_c^+ = .19). Conversely, conscientiousness had a strong negative relationship with doubts about actions (r_c^+ = −.37), a moderate negative relationship with discrepancy (r_c^+ = −.24), and small negative relationships with perfectionistic concerns (r_c^+ = −.18), concern over mistakes (r_c^+ = −.16), and socially prescribed perfectionism (r_c^+ = −.10).

Agreeableness, extraversion, and openness displayed fewer significant relationships with perfectionism dimensions. Agreeableness had a moderate positive relationship with high standards (r_c^+ = .22). Conversely, agreeableness had strong negative relationships with other-oriented perfectionism (r_c^+ = −.35), socially prescribed perfectionism (r_c^+ = −.31), and concern over mistakes (r_c^+ = −.30), moderate negative relationships with perfectionistic concerns (r_c^+ = −.26) and doubts about actions (r_c^+ = −.21), and small negative relationships with discrepancy (r_c^+ = −.16) and self-oriented perfectionism (r_c^+ = −.10). Extraversion had small positive relationships with high standards (r_c^+ = .19) and personal standards (r_c^+ = .11), and a marginal positive relationship with perfectionistic strivings (r_c^+ = .05). In contrast, extraversion had a strong negative relationship with doubts about actions (r_c^+ = −.37), moderate negative relationships with concern over mistakes (r_c^+ = −.25), discrepancy (r_c^+ = −.25), and perfectionistic concerns (r_c^+ = −.24), and a small negative relationship with socially prescribed perfectionism (r_c^+ = −.19). Lastly, openness displayed a strong positive relationship with high standards (r_c^+ = .33), small positive relationships with personal standards (r_c^+ = .18) and perfectionistic strivings (r_c^+ = .14), and small negative relationships with socially prescribed perfectionism (r_c^+ = −.13), discrepancy (r_c^+ = −.11), and perfectionistic concerns (r_c^+ = −.10).

Categorical Moderator Analysis

The total heterogeneity across studies implied that the variability in several weighted mean effects exceeded

Table 2. Summary of Overall Effect Sizes for the Relationships Between Perfectionism and Five-Factor Traits.

Variable	*k*	*N*	r^+	r_c^+	95% CI	Q_T	I^2 (%)	Egger's intercept	95% CI	k^{TF}	"Trim and fill" estimates r^+ (95% CI)	Power
Neuroticism												
Perfectionistic concerns	94	36,783	.42***	.50***	[.47; .53]	1,016.40***	90.85	−0.29	[−2.11; 1.53]	0	.50 [47; .53]	.99
Socially prescribed perfectionism	47	13,227	.32***	.37***	[.36; .42]	189.93***	75.78	0.23	[−1.66; 2.13]	10	.36 [.33; .39]	.99
Concern over mistakes	33	8,683	.45***	.53***	[.48; .58]	291.58***	89.03	1.22	[−2.26; 5.41]	5	.50 [.45; .55]	.99
Doubts about actions	25	7,031	.50***	.63***	[.58; .67]	235.23***	89.80	1.68	[−2.95; 6.30]	0	.63 [.58; .67]	.99
Discrepancy	13	4,328	.46***	.53***	[.46; .59]	87.47***	87.47	2.13	[−2.13; 6.39]	0	.53 [.46; .59]	.99
Perfectionistic strivings	95	28,296	.11***	.13***	[.10; .15]	362.79***	74.09	0.39	[−0.77; 1.54]	19	.08 [.06; .11]	.99
Self-oriented perfectionism	48	13,061	.13***	.15***	[.11; .19]	237.31***	80.20	−0.78	[−2.76; 1.20]	10	.10 [.05; .14]	.99
Personal standards	39	9,947	.10***	.12***	[.10; .15]	58.71*	35.28	0.97	[−0.48; 2.42]	7	.08 [.06; .10]	.99
High standards	13	4,328	.02	.02	[−.01; .06]	13.53	11.30	−0.36	[−2.03; 1.31]	0	.02 [−.01; .05]	.24
Other-oriented perfectionism	31	7,368	.10***	.14***	[.08; .19]	148.03***	79.73	−0.47	[−3.22; 2.29]	0	.14 [.08; .19]	.99
Extraversion												
Perfectionistic concerns	38	15,679	−.20***	−.24***	[−.28; −.21]	174.15***	78.75	0.58	[−1.37; 2.53]	0	−.24 [−.28; −.21]	.99
Socially prescribed perfectionism	21	5,302	−.16***	−.19***	[−.23; −.14]	62.34***	67.92	1.54	[−1.34; 4.42]	0	−.19 [−.23; −.14]	.99
Concern over mistakes	11	3,020	−.21***	−.25***	[−.31; −.20]	26.09**	61.67	−2.06	[−7.09; 2.97]	0	−.25 [−.31; −.20]	.99
Doubts about actions	11	3,020	−.29***	−.37***	[−.43; −.30]	40.79***	75.48	−2.21	[−8.58; 4.16]	0	−.37 [−.43; −.30]	.98
Discrepancy	9	3,344	−.21***	−.25***	[−.32; −.18]	24.41**	67.23	−2.03	[−4.75; 0.67]	0	−.25 [−.32; −.18]	.99
Perfectionistic strivings	37	12,062	.04*	.05*	[.01; .10]	194.37***	81.48	−2.15	[1.03; −4.25]	0	.05 [.01; .10]	.64
Self-oriented perfectionism	22	5,378	−.03	−.03	[−.08; .02]	76.31***	72.48	−0.61	[−3.59; 2.37]	0	−.03 [−.08; .02]	.20
Personal standards	10	2,548	.09***	.11***	[.07; .16]	10.77	0.00	−2.09	[−5.34; 1.16]	1	.11 [.07; .15]	.99
High standards	9	3,344	.16***	.19***	[.14; .24]	12.94	38.19	−0.42	[−2.77; 1.94]	0	.19 [.14; .24]	.99
Other-oriented perfectionism	17	4,434	.01	.01	[−.07; .08]	84.21***	81.00	−1.77	[−5.69; 2.15]	0	.01 [−.07; .08]	.05
Openness to experience												
Perfectionistic concerns	30	12,308	−.08***	−.10***	[−.14; −.06]	156.89***	81.52	−2.62	[−4.91; −0.33]	0	−.10 [−.14; −.06]	.99
Socially prescribed perfectionism	15	3,291	−.10***	−.13***	[−.19; −.07]	43.89***	68.10	−2.32	[−8.63; 3.99]	0	−.13 [−.19; −.07]	.99
Concern over mistakes	8	2,382	−.03	−.03	[−.12; .05]	29.93***	76.61	−6.18	[−14.19; 1.84]	3	−.09 [−.18; .00]	.12
Doubts about actions	8	2,382	−.05	−.06	[−.18; .06]	59.73***	88.28	−10.33	[−20.21; −0.44]	0	−.06 [−.18; .06]	.18
Discrepancy	8	3,260	−.09***	−.11***	[−.16; −.05]	13.61	48.57	−0.74	[−3.68; 2.20]	0	−.11 [−.16; −.05]	.96
Perfectionistic strivings	28	9,253	.11***	.14***	[.06; .21]	332.32***	91.88	−0.65	[−4.97; 3.67]	0	.14 [.06; .21]	.96
Self-oriented perfectionism	15	3,291	.02	.02	[−.04; .08]	41.90***	66.59	−1.01	[−7.29; 5.28]	0	.02 [−.01; .05]	.09
Personal standards	7	1,910	.14***	.18***	[.10; .26]	19.32**	68.94	3.35	[−4.88; 11.58]	0	.18 [.10; .26]	.99
High standards	8	3,260	.26***	.33***	[.16; .49]	172.91***	95.95	5.16	[−4.34; 14.68]	0	.33 [.16; .49]	.95
Other-oriented perfectionism	11	2,432	.02	.03	[−.05; .10]	29.63**	66.25	0.58	[−6.11; 7.26]	0	.03 [−.05; .10]	.10

(continued)

Table 2. (continued)

Variable	*k*	*N*	r^+	r_c^+	95% CI	Q_T	I^2 (%)	Egger's intercept	95% CI	k^{TF}	"Trim and fill" estimates r^+ (95% CI)	Power
Agreeableness												
Perfectionistic concerns	32	13,099	−.21***	−.26***	[−.31; −.22]	217.49***	85.75	−0.80	[−3.62; 2.02]	5	−.30 [−.34; −.25]	.99
Socially prescribed perfectionism	16	3,638	−.25***	−.31***	[−.38; −.25]	76.29***	80.34	6.02	[−0.78; 12.81]	0	−.31 [−.38; −.25]	.99
Concern over mistakes	9	2,604	−.25***	−.30***	[−.35; −.25]	13.54	40.91	0.56	[−5.29; 6.41]	1	−.30 [−.35; −.26]	.99
Doubts about actions	9	2,604	−.16**	−.21**	[−.35; −.07]	110.84***	92.78	4.38	[−10.64; 21.52]	0	−.21 [−.35; −.07]	.82
Discrepancy	8	3,260	−.13***	−.16***	[−.21; −.11]	10.94	36.02	−0.15	[−2.86; 2.57]	0	−.16 [−.21; −.11]	.99
Perfectionistic strivings	30	9,822	−.02	−.02	[−.10; .05]	365.86***	92.07	−4.95	[−8.83; −1.07]	0	−.02 [−.10; .05]	.10
Self-oriented perfectionism	16	3,638	−.08***	−.10***	[−.15; −.05]	38.32**	60.86	1.12	[−4.24; 6.48]	0	−.10 [−.15; −.05]	.96
Personal standards	8	2,132	−.05	−.07	[−.14; .01]	20.29**	65.00	0.71	[−7.19; 8.60]	0	−.05 [−.14; .01]	.42
High standards	8	3,260	.17**	.22***	[.10; .34]	77.57***	90.98	−0.67	[−7.88; 6.54]	0	.22 [.10; .34]	.93
Other-oriented perfectionism	12	2,770	−.27***	−.35***	[−.43; −.25]	76.77***	85.67	0.94	[−8.52; 10.40]	0	−.35 [−.43; −.25]	.99
Conscientiousness												
Perfectionistic concerns	44	17,323	−.15***	−.18***	[−.21; −.14]	220.67***	80.51	0.84	[−0.92; 2.62]	0	−.18 [−.21; −.14]	.99
Socially prescribed perfectionism	21	6,223	−.08***	−.10***	[−.14; −.05]	48.93***	59.13	−0.18	[−2.26; 1.89]	0	−.10 [−.14; −.05]	.99
Concern over mistakes	9	2,722	−.14***	−.16***	[−.23; −.10]	21.87***	63.42	−2.75	[−10.06; 4.55]	0	−.16 [−.23; −.10]	.99
Doubts about actions	9	2,722	−.29***	−.37***	[−.44; −.29]	41.32***	80.64	−5.06	[−14.64; 4.52]	0	−.37 [−.44; −.29]	.99
Discrepancy	16	4,663	−.21***	−.24***	[−.29; −.19]	43.21***	65.28	−0.55	[−2.82; 1.72]	0	−.24 [−.29; −.19]	.99
Perfectionistic strivings	46	14,647	.36***	.44***	[.39; .48]	572.13***	92.14	2.24	[−0.59; 5.07]	0	.44 [.39; .48]	.99
Self-oriented perfectionism	26	6,885	.35***	.42***	[.33; .50]	441.03***	94.33	3.96	[−0.64; 8.56]	0	.42 [.33; .50]	.99
Personal standards	8	2,250	.32***	.40***	[.35; .46]	17.66*	60.37	−1.17	[−8.54; 6.20]	0	.40 [.35; .46]	.99
High standards	16	4,663	.40***	.49***	[.43; .54]	85.61***	82.48	2.48	[−0.42; 5.38]	2	.47 [.42; .53]	.99
Other-oriented perfectionism	16	4,120	.15***	.19***	[.14; .24]	35.09**	57.26	1.10	[−1.66; 3.87]	0	.19 [.14; .24]	.99

Note. k = number of studies; N = total number of participants in the k samples; r^+ = observed weighted mean correlation; r_c^+ = disattenuated weighted mean correlation; disattenuated effect sizes were obtained by dividing the observed correlation by the square root of the product of the two corresponding Cronbach's alpha coefficients; **CI** = confident interval for r_c^+; Q_T = measure of heterogeneity for r_c^+; I^2 = percentage of heterogeneity for r_c^+; k^{TF} = number of imputed studies as part of "trim and fill" method fo r_c^+.
*$p < .05$. **$p < .01$. ***$p < .001$.

that associated with sampling error. The percentage of total heterogeneity across studies ranged from 0% to 96.0%. This suggests variability among certain relationships was due to additional sources and alludes to the possible influence of moderators.

Perfectionism subscale, FFM versus non-FFM measure, and nationality were tested as categorical moderators of perfectionistic concerns–FFM relationships and perfectionistic strivings–FFM relationships (see Supplemental Material J). As hypothesized, the positive relationships between discrepancy and neuroticism, concern over mistakes and neuroticism, and doubts about actions and neuroticism (r_c^+ = .53 to .63) were stronger than the positive relationship between socially prescribed perfectionism and neuroticism (r_c^+ = .39). Also, as hypothesized, the small positive relationships between self-oriented perfectionism and neuroticism and personal standards and neuroticism (r_c^+ = .12 to .15) were stronger than the marginal positive relationship between personal standards and neuroticism (r_c^+ = .02). Moreover, consistent with hypotheses, the moderate positive relationship between high standards and agreeableness (r_c^+ = .22) was stronger than the marginal-to-small positive relationships between self-oriented perfectionism and agreeableness and personal standards and agreeableness (r_c^+ = −.07 to –.10).

Further moderating effects were found that were not hypothesized. The strong negative relationship between doubts about actions and conscientiousness (r_c^+ = −.36) was larger than the moderate negative relationships between discrepancy and conscientiousness and concern over mistakes and conscientiousness (r_c^+ = −.16 to –.24), which in turn were larger than the small negative relationship between socially prescribed perfectionism and conscientiousness (r_c^+ = −.10). Likewise, the moderate-to-strong positive relationships between personal standards and openness and high standards and openness (r_c^+ = .18 to .33) were larger than the marginal positive relationship between self-oriented perfectionism and openness (r_c^+ = .02). Moreover, the strong negative relationship between doubts about actions and extraversion (r_c^+ = −.37) was larger than the moderate-to-strong negative relationships between discrepancy and extraversion, concern over mistakes and extraversion, and socially prescribed perfectionism and extraversion (r_c^+ = −.19 to –.25). Additionally, the small positive relationship between high standards and extraversion (r_c^+ = .18) was larger than the small positive relationship between personal standards and extraversion (r_c^+ = .11), which in turn was larger than the marginal negative relationship between self-oriented perfectionism and extraversion (r_c^+ = −.03). Taken together, these findings suggest that the perfectionism subscale used moderated perfectionistic concerns' relationships with neuroticism, extraversion, and conscientiousness, as well as perfectionistic strivings' relationships with neuroticism, extraversion, openness, and agreeableness.

Findings regarding nationality were mixed. On one hand, relationships between personal standards and neuroticism, self-oriented perfectionism and openness, and socially prescribed perfectionism and conscientiousness were stronger in Canadian samples relative to American samples. On the other hand, relationships between other-oriented perfectionism and neuroticism, perfectionistic strivings and extraversion, self-oriented perfectionism and extraversion, perfectionistic strivings and agreeableness, and other-oriented perfectionism and conscientiousness were stronger in American samples relative to Canadian samples. Lastly, the relationship between perfectionistic strivings and neuroticism and the relationship between self-oriented perfectionism and neuroticism were stronger for scales not intended to measure FFM personality structure (r_c^+ = .19 to .22) versus scales intended to measure FFM personality structure (r_c^+ = .11).

Continuous Moderator Analysis

Results for the moderating effect of age, gender, and year of data collection on perfectionism–FFM relationships are in Supplemental Material K. To summarize our main findings, age moderated the perfectionistic strivings–conscientiousness link (β = −.013, $p < .001$, R^2 = .38), the self-oriented perfectionism–conscientiousness link (β = −.017, $p < .001$, R^2 = .62), the perfectionistic strivings–neuroticism link (β = .003, p = .032, R^2 = .08), and the self-oriented perfectionism-neuroticism link (β = .006, p = .025, R^2 = .14). Indeed, perfectionistic strivings' and self-oriented perfectionism's positive relationships with conscientiousness decreased as mean sample age increased (Supplemental Figure L1 and L2). For samples with mean ages of 15, 30, and 45 years, the implied disattenuated correlations for perfectionistic strivings and conscientiousness were r_c^+ = .54, r_c^+ = .39, and r_c^+ = .22, and the corresponding implied disattenuated correlations for self-oriented perfectionism and conscientiousness were r_c^+ = .60, r_c^+ = .42, and r_c^+ = .19. Conversely, perfectionistic strivings' and self-oriented perfectionism's positive relationship with neuroticism increased as age increased (Supplemental Figure L3 and L4). The implied disattenuated correlations between perfectionistic strivings and neuroticism for samples with mean ages of 15, 30, and 45 years were r_c^+ = .10, r_c^+ = .14, and r_c^+ = .19, and the corresponding implied disattenuated correlations for self-oriented perfectionism and neuroticism were r_c^+ = .11, r_c^+ = .20, and r_c^+ = .28. Furthermore, the moderating effect of age on perfectionistic strivings and conscientiousness, self-oriented perfectionism and conscientiousness, perfectionistic strivings and neuroticism, and self-oriented perfectionism and neuroticism remained significant ($p < .05$) after controlling for gender, year of data collection, perfectionism subscale, and FFM versus non-FFM measure.

Additionally, gender moderated the perfectionistic strivings–neuroticism link (β = .12, p = .018, R^2 = .07), the other-oriented perfectionism–neuroticism link (β = .44, p = .001, R^2 = .39), the discrepancy–conscientiousness

link (β = −.30, p = .005, R^2 =.68), the socially prescribed perfectionism–agreeableness link (β = .85, p = .033, R^2 =.27), and the self-oriented perfectionism–agreeableness link (β = .68, p = .002, R^2 =.76). Notably, perfectionistic strivings' positive relationship with neuroticism increased as the percentage of females increased (Supplemental Figure L5). The implied disattenuated correlations between perfectionistic strivings and neuroticism for an all-male, a 50% female, and an all-female sample were r_c^+ = .04, r_c^+ = .10, and r_c^+ = .16. Likewise, other-oriented perfectionism's positive relationship with neuroticism increased as the percentage of females increased. The implied disattenuated correlations for other-oriented perfectionism and neuroticism were r_c^+ = –.20, r_c^+ = .02, and r_c^+ = .24. Similarly, the negative relationship between discrepancy and conscientiousness increased as the percentage of females increased. The implied disattenuated correlations between discrepancy and conscientiousness for an all-male, a 50% female, and an all-female sample were r_c^+ = –.04, r_c^+ = –.20, and r_c^+ = –.34. Also, socially prescribed perfectionism's and self-oriented perfectionism's negative relationships with agreeableness decreased as the percentage of females increased (Supplemental Figure L6). The implied disattenuated correlations between socially prescribed perfectionism and agreeableness for an all-male, a 50% female, and an all-female sample were r_c^+ = –.72, r_c^+ = –.45, and r_c^+ = –.06; the corresponding implied disattenuated correlations for self-oriented perfectionism and agreeableness were r_c^+ = –.53, r_c^+ = –.24, and r_c^+ = .14. Furthermore, the moderating effect of gender on perfectionistic strivings and neuroticism, other-oriented perfectionism and neuroticism, discrepancy and conscientiousness, socially prescribed perfectionism and agreeableness, and self-oriented perfectionism and agreeableness remained significant ($p < .05$) after controlling for age, year of data collection, perfectionism subscale, and FFM versus non-FFM measure. However, inspection of funnel plots suggested that the moderating effect of gender on the other-oriented perfectionism–neuroticism link and the discrepancy–conscientiousness link was driven by outliers (Supplemental Figures L8 and L9) and therefore should be interpreted with caution.

Finally, the year of data collection moderated the discrepancy–neuroticism link (β = −.06, p = .007, R^2 = .57) and the other-oriented perfectionism–extraversion link (β = .17, p = .001, R^2 = .51). The relationship between discrepancy and neuroticism decreased as the year of data collection increased (Supplemental Figure L10), whereas the relationship between other-oriented perfectionism and extraversion increased as the year of data collection increased (Supplemental Figure L11). The moderating effect of the year of data collection on the discrepancy–neuroticism link and the other-oriented perfectionism–extraversion link remained significant after controlling for gender, age, and the year of data collection. Findings regarding the moderating effect of the perfectionism subscale used and FFM versus non-FFM measure provided the same implications in terms of significance as our categorical findings.

Publication Bias

Comparisons between effects from published and unpublished studies provided mixed evidence of publication bias (Supplemental Material J). Congruent with publication bias, the magnitude of certain effects were stronger for published studies relative to unpublished studies. For example, the relationship between perfectionistic strivings and conscientiousness was stronger for published (r_c^+ = .49) than unpublished studies (r_c^+ = .35). Contrary to publication bias, some effects were *smaller* for published relative to unpublished studies. For example, the relationship between concern over mistakes and conscientiousness was smaller for published (r_c^+ = −.11) than unpublished studies (r_c^+ = −.23). Similarly, funnel plots (Supplemental Material M) and Egger's regression intercepts (Table 2) provided mixed evidence for publication bias. Whereas Egger's regression intercept was significant for certain effects, adjusted "trim and fill" estimates provided the same substantive implications in terms of magnitude and significance.

Secondary Analyses

Results for the moderating effect of the year of data collection, age, and gender on levels of perfectionism are in Supplementary Material N. For ease of interpretation, total scores and their standard deviations were divided by the number of subscale items. Year of data collection moderated doubts about action (β = .07, p = .002, R^2 = .38) but not socially prescribed perfectionism (β = .46, p = .094, R^2 = .05). However, consistent with hypotheses, after controlling for gender and age, the moderating effect of the year of data collection on socially prescribed perfectionism became significant (p = .034) and the moderating effect of the year of data collection on doubts about action remained significant. Likewise, age moderated self-oriented perfectionism (β = .02, p = .026, R^2 = .10) and personal standards (β = −.02, p < .001, R^2 = .41). These effects remained significant ($p < .05$) after controlling for the year of data collection and gender. Results imply that socially prescribed perfectionism (Supplemental Figure O1) and doubts about action (Supplemental Figure O2) have increased linearly over time and that self-oriented perfectionism (Supplemental Figure O3) and personal standards (Supplemental Figure O4) decrease across the life span.

Discussion

Broad personality traits and multidimensional perfectionism are inextricably intertwined (Adler, 1938; Dunkley et al., 2012; Hamachek, 1978; Hill et al., 1997). In fact, theory suggests a dynamic interplay between broad personality

traits and the social environment gives rise to specific traits, such as perfectionism (McAdams & Pals, 2006; McCrae & Costa, 1997). Hence, from a theoretical standpoint, situating perfectionism within comprehensive personality frameworks, such as the five-factor model (FFM), provides insights into the origins of perfectionism (Enns & Cox, 2002). Likewise, from a practical standpoint, the FFM offers a useful heuristic for comparing perfectionism dimensions developed by different researchers. Even so, our understanding of perfectionism's place within the FFM is clouded by underpowered studies, inconsistent findings, and the tendency to use perfectionism subscales interchangeably. We addressed these challenges by conducting the first meta-analytic review of the relationships between multidimensional perfectionism and FFM traits. Findings were derived from 77 studies with 95 samples and 24,789 participants, representing the most comprehensive test of perfectionism–FFM relationships to date. Neuroticism and conscientiousness displayed the strongest, most consistent, relationships with perfectionism dimensions. Likewise, almost all perfectionism dimensions had distinct FFM profiles. And moderator analyses revealed that several perfectionism–FFM relationships hinged on gender, age, and the perfectionism subscale used, even after controlling for the year of data collection.

An Improved Understanding of Perfectionism–FFM Relationships

Neuroticism had significant positive relationships with all perfectionism dimensions—except high standards. This dovetails with longstanding theoretical accounts implicating neuroticism in the origins of perfectionism (Adler, 1938; Ellis, 1958; Hamachek, 1978; Horney, 1950). We refined this literature, showing that perfectionism dimensions are differentially related to neuroticism. As hypothesized, perfectionistic concerns (socially prescribed perfectionism, concern over mistakes, doubts about actions, and discrepancy) were primarily characterized by neuroticism, and to a lesser extent, by low extraversion and low agreeableness. As such, people with high perfectionistic concerns tend to be worrying, emotional, insecure, and jealous. Furthermore, they are prone to dysfunctional thinking and maladaptive coping responses, which corresponds to theory and evidence suggesting perfectionistic concerns are an unambiguously negative form of perfectionism associated with psychological distress, illogical beliefs, and maladjustment (Ellis, 2002; Smith et al., 2016; Smith et al., 2018; Stoeber & Otto, 2006).

In contrast, the positive relationship between perfectionistic strivings and neuroticism was not substantive ($r_c^+ < .20$). Thus, though people who strive for perfection tend to have neurotic tendencies, neuroticism is not characteristic of perfectionistic strivings to the same extent as it is characteristic of perfectionistic concerns. This supports Hamachek's (1978) notion of neurotic and non-neurotic forms of perfectionism. Nonetheless, the overlap between perfectionistic strivings and neuroticism, albeit small, is theoretically meaningfully as it aligns with a broader literature that draws into question the practice of a-priori labeling perfectionistic strivings as "adaptive perfectionism" (e.g., Smith et al., 2016; Smith et al., 2018; Stoeber, 2018).

Turning to conscientiousness, relationships were more divergent. As hypothesized, perfectionistic strivings were primarily characterized by conscientiousness. Hence, people with elevated perfectionistic strivings can be regarded as responsible, thorough, efficient, and self-disciplined. Yet, the disattentuated relationship between conscientiousness and perfectionistic strivings was only .44. Moreover, perfectionistic concerns had a small negative relationship with conscientiousness. As such, though perfectionism as assessed through self-rated adjectives loads strongly on conscientiousness (Ashton, Lee, & Boies, 2015), perfectionistic strivings and perfectionistic concerns appear to contain content that goes beyond conscientiousness, such as a compulsive need for the self to be perfect and flawless (Flett & Hewitt, 2015).[2]

Regarding *extraversion*, the magnitude of relationships was generally smaller. Even so, as hypothesized, perfectionistic concerns showed a substantial negative relationship with extraversion. This implies that people with high perfectionistic concerns tend to be quiet, aloof, inhibited, timid, and—importantly—have a reduced capacity to experience positive emotions. Given that low positive emotionality predicts depression (Khazanov & Ruscio, 2016), the negative relationship between perfectionistic concerns and extraversion intersects with Smith et al.'s (2016) finding that perfectionistic concerns confer risk for depressive symptoms.

In terms of *agreeableness*, as hypothesized, other-oriented perfectionism was primarily characterized by low agreeableness. This suggests that people with high other-oriented perfectionism tend to be irritable, uncooperative, suspicious, and critical. Furthermore, this finding aligns with research suggesting that people with high other-oriented perfectionism denigrate others, are continually disappointed in others, and are perpetually in conflict with others (Hewitt & Flett, 1991; Sherry, Mackinnon, & Gautreau, 2016). Likewise, perfectionistic concerns displayed a substantial negative relationship with agreeableness. This is congruent with theory and research suggesting that perfectionistic concerns are associated with feelings of being disliked and rejected by others (Hewitt, Flett, Sherry, & Caelian, 2006). If as Moretti and Higgins (1999) assert, we have an internal audience that includes intrapsychic representations of others' opinions and expectations, then people with elevated perfectionistic concerns view their internal audience as disgruntled, which may make them disagreeable with and antagonistic toward others.

Last, only one out of the eight perfectionism dimensions correlated substantially with openness: high standards. Thus, perfectionists appear to be neither more nor less open to

experience than non-perfectionists (cf. Stoeber et al., 2018), with one caveat. People with elevated high standards appear to be slightly more intellectual, complex, philosophical, and innovative. That said, whether high standards as measured by Slaney et al.'s (2001) APS-R actually captures perfectionism is debatable given that high standards are not necessarily *perfectionistic* standards (Blasberg et al., 2016; Flett & Hewitt, 2006, 2015). Accordingly, our finding that only high standards showed a substantial positive correlation with openness adds to the literature suggesting that high standards differ from perfectionistic standards, which was also confirmed by our moderator analyses.

Moderators of Perfectionism–FFM Relationships: Subscales, Gender, and Age

As hypothesized, the subscales comprising perfectionistic concerns were differentially related to neuroticism. That is, the positive relationships between concern over mistakes and neuroticism, doubts about actions and neuroticism, and discrepancy and neuroticism were substantially larger than the positive relationship between socially prescribed perfectionism and neuroticism. We speculate this reflects the absence of negative mood terms (e.g., "sad") in socially prescribed perfectionism and the presence of negative mood terms in concern over mistakes ("upset"), doubts about actions ("doubts"), and discrepancy ("frustrated," "worry," "disappointed"). As Clark and Watson (1995) have cautioned

> the inclusion of almost any negative mood term . . . virtually guarantees that an item will have a substantial neuroticism component; the inclusion of several such affect-laden items in turn ensures the resulting scale—regardless of its intended construct—will be primarily a marker of neuroticism. (p. 312)

So, should investigators favor socially prescribed perfectionism over concern over mistakes, doubts about actions, and discrepancy? If distinguishing between perfectionism and neuroticism is important, then researchers may profit from using socially prescribed perfectionism. In other circumstances, concern over mistakes, doubts about actions, and discrepancy likely remain useful. Nonetheless, a clear implication of our finding is the need for research on the effect of instrumentation on the perfectionistic concerns–neuroticism link.

Turning to perfectionistic strivings, as hypothesized, the subscales comprising perfectionistic strivings were differentially related to neuroticism and agreeableness. Specifically, self-oriented perfectionism and personal standards, but not high standards, showed small positive relationships with neuroticism. Furthermore, self-oriented perfectionism had a small negative relationship with agreeableness, personal standards were unrelated to agreeableness, and high standards had a moderate positive relationship with agreeableness. Moreover, though not hypothesized, results indicated that the subscales comprising perfectionistic strivings are differentially related to openness and extraversion. In particular, self-oriented perfectionism was unrelated to openness, personal standards showed a small positive relationship with openness, and high standards showed a large positive relationship with openness. Similarly, self-oriented perfectionism was unrelated to extraversion, whereas personal standards and high standards showed a small positive relationship with extraversion. Thus, an overarching point to emphasize is that our findings support the view that self-oriented perfectionism captures more destructive aspects of perfectionistic strivings than personal standards and high standards (Blasberg et al., 2016; Flett & Hewitt, 2006, 2015).

Our findings also suggest the debate regarding whether perfectionistic strivings are adaptive (e.g., Stoeber & Otto, 2006) or maladaptive (e.g., Smith et al., 2018) derives in part from how we measure perfectionistic strivings. To illustrate, consider a researcher who measures perfectionistic strivings using high standards (Slaney et al., 2001)—a subscale assessing striving for excellence (Blasberg et al., 2016). Such a researcher may reasonably conclude perfectionistic strivings are adaptive because people with elevated high standards tend to be more open, conscientious, agreeable, and extraverted. Now consider an investigator who measures perfectionistic strivings using personal standards—a subscale assessing striving for perfection (Frost et al., 1990). Such a researcher might conclude perfectionistic strivings are somewhat adaptive because people with high personal standards tend to be more open, conscientious, and extraverted, although also more neurotic. Lastly, consider a researcher who measures perfectionistic strivings using self-oriented perfectionism—a subscale assessing self-generated pressures to be perfect (Hewitt & Flett, 1991). Such a researcher will likely conclude that perfectionistic strivings are predominantly maladaptive because people with high self-oriented perfectionism tend to be more conscientious, but also more neurotic and less agreeable.

Furthermore, meta-regression revealed that the (mal) adaptiveness of perfectionistic strivings hinges on gender and age. Indeed, the positive relationship between perfectionistic strivings and neuroticism increased as the percentage of females increased. This result complements Hewitt, Flett, and Blankstein's (1991) finding that self-oriented perfectionism correlates positively with neuroticism in females but not males. Additionally, the positive relationship between perfectionistic strivings and conscientiousness decreased as the mean age of the samples increased, whereas the positive relationship between perfectionistic strivings and neuroticism increased as the mean age of samples increased. But, why might people high in perfectionistic strivings become increasingly neurotic and decreasingly conscientious over time? One possibility is our findings reflect the tendency for people high in perfectionistic strivings to base their self-worth on achieving perfection (Sturman, Flett, Hewitt, & Rudolph, 2009)—a goal that is intangible, fleeting, and rare. Indeed, we speculate that over time people with

elevated perfectionistic strivings experience a high frequency of perceived failures and a low frequency of perceived successes. And after repeatedly falling short of their self-imposed goal of "perfection," people with high perfectionistic strivings become less conscientious and more neurotic (cf. Stoeber, Schneider, Hussain, & Matthews, 2014).

Levels of Perfectionism Across Time, Age, and Gender

As hypothesized, and consistent with Curran and Hill (in press), levels of socially prescribed perfectionism appear to have linearly increased over time. Additionally, we found that levels of doubts about actions also appear to have increased over time. Furthermore, our findings indicated that as people grow older, levels of self-oriented perfectionism and personal standards decline. This stands in contrast to conscientiousness, which typically increases over the life span (Roberts, Walton, & Viechtbauer, 2006). We did not, however, find gender differences, which suggests that males and females report similar levels of perfectionism (cf. Hyde, 2005).

Limitations of Overall Literature

Our meta-analysis offers new insights into the state of the perfectionism–FFM literature and, by doing so, underscores limitations. One limitation is an over-reliance on cross-sectional designs. In fact, 71 of the 77 included studies used cross-sectional designs; and though cross-sectional designs are sometimes useful, cross-sectional designs are incapable of clarifying temporal precedence and directionality. As such, longitudinal research on perfectionism and FFM traits is needed to determine which perfectionism–FFM relationships reflect mere covariation, showing us where different perfectionism dimensions "fit" within the FFM, and which relationships reflect dynamic processes that give rise to perfectionism. Moreover, though there are numerous investigations on perfectionism and the FFM, there is a paucity of research on perfectionism and the HEXACO model (cf. Stoeber, 2014). Likewise, all included studies used mono-source designs and focused solely on self-reports. Mono-source designs are problematic when studying traits such as perfectionism in which self-presentational bias could influence results (Stoeber & Hotham, 2013). Last, 52 included studies had sample sizes below 250, suggesting that a substantial portion of the perfectionism–FFM literature is underpowered.

Limitations of the Present Study and Future Directions

Limitations in the literature translate into limitations in our analyses. Only three included studies used the NEO-PI-R. As such, we were unable to provide a more finely grained, hierarchical analysis of the relationships between perfectionism dimensions and FFM facets (cf. Costa & McCrae, 1995). Samples were also predominantly Caucasian, and our results may have limited generalizability to more ethnically diverse samples. Likewise, the extent to which perfectionism–FFM relationships were influenced by overlap among perfectionism dimensions is unclear. Furthermore, the exclusive use of self-report measures may have inflated the effect sizes reported due to shared method variance. It is essential that future research addresses this limitation by supplementing self-reports with observer reports (see McCrae, 1994). Finally, samples were predominantly female, and the age range of the included studies (15.4 to 49.0 years) was restricted. Hence, we were unable to evaluate the moderating effect of age on perfectionism–FFM relationships across the full life span. Nonetheless, given our findings, research on the extent to which gender and age impact the expression of perfectionism is an important area of future inquiry. Indeed, investigators could add substantially to the perfectionism–FFM literature by studying perfectionism and FFM traits in a large sample with a broad age range and testing whether the age and gender differences reported replicate across FFM domains and facets.

Concluding Remarks

Our meta-analysis offers the most rigorous test of the relationships between perfectionism dimensions and FFM traits to date. Results align with theory and research suggesting that broad FFM traits are crucial to understanding perfectionism (cf. Stoeber et al., 2018). We added incrementally to this literature by providing a comprehensive quantitative review that brings greater specificity to our understanding of perfectionism–FFM relationships. In synthesizing this literature, we showed that perfectionistic concerns were primarily characterized by neuroticism (and to a lesser extent low extraversion and low agreeableness), perfectionistic strivings were primarily characterized by conscientiousness, and other-oriented perfectionism was primarily characterized by low agreeableness. Our findings also underscored that perfectionism–FFM relationships change meaningfully depending on how perfectionism is assessed, the age of participants, and the percentage of female participants.

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Notes

1. Following Stoeber's (2018) guidelines, we refer to "adaptive perfectionism" as "perfectionistic strivings."
2. The first and second author independently rated the potential overlap of items measuring (a) self-oriented perfectionism and conscientiousness, (b) personal standards and conscientiousness, and (c) high standards and conscientiousness. An item from one construct (e.g., self-oriented perfectionism) was designated as potentially overlapping with conscientiousness if both raters identified the items as potentially overlapping. Three self-oriented perfectionism items (see 14, 36, and 40 in Hewitt & Flett, 2004), three personal standards items (see 12, 16, and 19 in Frost et al., 1990), and five high standards items (see 1, 8, 12, 18, and 22 in Slaney et al., 2001) were rated as potentially overlapping with conscientiousness. These results are available upon request from the first author.

Supplemental Material

Supplemental material for this article is available online.

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