



# Personality and sex differences in mattering and purpose-in-life

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## Abstract

Mattering and purpose-in-life are key aspects of individuals' perception of who they are and their relationships with others. However, their associations with personality, as well as sex differences within these associations, remain relatively unexplored. Three studies investigated, respectively, the correlation between mattering and purpose-in-life across sexes ( $N_1 = 906$ ), their measurement invariance by sex and associations with the Big-Five ( $N_2 = 400$ ), and with antagonistic traits ( $N_3 = 178$ ), including potential sex differences in these associations. Study 1 found lower purpose-in-life in women compared to men, but no difference in mattering. Additionally, a positive and moderate correlation between mattering and purpose-in-life was observed, but no sex differences. Study 2 found higher factor covariance in men than women. Moreover, it showed that conscientiousness positively predicts mattering and purpose-in-life, neuroticism negatively predicts both, and agreeableness positively predicts purpose-in-life. Study 3 showed that primary and secondary psychopathy negatively predict mattering, grandiose narcissism positively predicts mattering and purpose-in-life, and secondary psychopathy negatively predicts purpose-in-life, in all cases showing no sex differences. These results highlight the importance of mattering and purpose-in-life in personality research and intervention, offering insights for personality development by addressing dysfunctional perceptions and fostering personal and professional growth across various applied settings. For instance, in counseling, leveraging mattering and purpose-in-life could help clients strengthen their resilience and coping skills. In educational settings, mattering and purpose-in-life could support learners' self-efficacy and improve educational outcomes. In organizational settings, they could drive change by enhancing individuals' confidence, productivity, and leadership.

**Keywords** Mattering · Purpose-in-life · Sex differences · Big-five · Dark traits

## Introduction

Mattering and purpose-in-life relate to how individuals feel about themselves and perceive their value to others. Both are associated with greater autonomy, life satisfaction, health, and well-being (Hedberg et al., 2010; Stoyles et al., 2015).

Specifically, *mattering* is defined as individuals' perception of their significance to others (Marshall & Tilton-Weaver, 2019, p. 541), while *purpose-in-life* refers to a sense of meaning, direction, and intention that individuals experience through their action (Hill et al., 2016). Although there has long been recognition of their essential role in individuals'

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development, research has only recently explored their relationship, associations with personality, and whether and to what extent these associations differ across sexes. In fact, few studies have examined their relationship, finding greater perceptions of mattering are associated with higher purpose-in-life (Dixon, 2007; France & Finney, 2009). Some recent research has also indicated associations between mattering and personality traits (Flett, 2022, Flett et al., 2023) and sex differences in mattering (Scarpa et al., 2021).

The present work seeks to contribute to research in mattering and purpose-in-life by examining their relationship, their associations with both adaptive and antagonistic personality, and investigate potential sex differences in these associations. Specifically, the research builds upon the need for clarity on those relationships, not only to improve our understanding of the two constructs and contribute to theory, but also facilitate their use in real-world applications. For example, Flett et al. (2023) have recently highlighted the potential of mattering to be maladaptive when associated with excessive or obsessive concerns about one's own significance to others, a dysfunctional form of self-centeredness, which in turn, is commonly observed in antagonistic or 'dark' personalities (e.g., high narcissism and psychopathy). In the same vein, assuming a positive correlation between mattering and purpose-in-life, it is sensible to hypothesize that some personality traits but not others may be associated with individuals' self-perceptions of mattering and purpose-in-life and guide behavior across a range of settings, a key question considered by the present research.

## Mattering

Mattering underlies an individual's motivation to belong, which is satisfied by interpersonal connections, i.e., temporally stable emotionally fulfilling contacts and affective concerns about one's well-being (Baumeister & Leary, 1995). Specifically, mattering facilitates the selection of cognitive and affective information to support individuals' appraisals of their role within a given setting. Such judgements are influenced by self-perceptions and beliefs about being significant to other people (Schlossberg, 1989). Most of the extant research on mattering has focused on the impact that mattering exerts upon subjective well-being (Marshall, 2001; Rosenberg & McCullough, 1981). For example, it is well-known that individuals high in mattering tend to experience reduced anxiety and depression (Flett et al., 2012; Taylor & Turner, 2001) and that perceived feelings of unimportance to others are implicated in the development of depression and related symptoms (Joeng & Turner, 2015a, 2015b). Moreover, individuals' perceptions of mattering are temporally stable (Etherson et al., 2021), which suggests that mattering

can influence current and future life experiences and drive short- and long-term life goals and outcomes, possibly being linked to underlying personality configurations. Therefore, research is needed to characterize mattering from a personality and individual differences perspective.

## Purpose-in-life

Purpose-in-life involves individuals' goal-directed thinking and behavior to derive meaning from life experiences (Boyle et al., 2010; Reker et al., 1987). Frankl (1978) suggested that purpose-in-life may play a crucial role in the meaning-making process that bestows an individual's self-actualization. This is evident in clinical practice, where psychological well-being fundamentally depends on discovering one's purpose-in-life. Indeed, research evidences the impact of purpose-in-life on individuals' adjustment and mental well-being (Ryff & Singer, 1998). Studies consistently demonstrate that purpose-in-life promotes life satisfaction while also decreasing the likelihood of psychopathology, for instance, depression and suicide ideation (Hedberg et al., 2010; Heisel & Flett, 2004; Reker et al., 1987; Stoyles et al., 2015). In the same vein, findings from a longitudinal study conducted over a four-year period showed that individuals who reported higher levels of purpose-in-life at baseline had better overall physical, behavioral, and psychosocial health (Kim et al., 2021). This evidence suggests that purpose-in-life can influence the way individuals enjoy and experience life and cope with adversities, potentially representing a key target for prevention and intervention across various applied domains.

## Mattering, purpose-in-life, and personality

To date, few studies have examined the relationship between mattering, purpose-in-life and personality, with most exploring these constructs in isolation rather than in an integrative framework. For example, mattering was found to be positively associated with extraversion, openness, and agreeableness, and negatively with neuroticism (Flett et al., 2016; Flett, 2022), possibly reflecting a resilient personality profile linked with a positive sense of self and importance to others. Other studies showed positive relationships between mattering and essential regulatory processes, such as self-compassion (Joeng & Turner, 2015a, 2015b) and self-efficacy (Gruber et al., 2009), and negative associations between mattering and a range of vulnerabilities, such as trait self-criticism (Besser et al., 2022; Flett, 2022) rumination (Rose & Kocovski, 2021), and maladaptive facets of socially prescribed perfectionism (Flett et al., 2012). Similarly, positive links were observed between purpose-in-life and adaptive personality (Hill & Burrow, 2012; Hill et al., 2016). Nevertheless, the effects

observed between personality and mattering have generally been low to moderate and have emerged across samples of varying sizes and characteristics, thus warranting replication.

Conversely, research also found a link between unfulfilled need for mattering/quest for personal significance and violent acts, such as those observed in criminal behavior (Billingham & Irwin-Rogers, 2021; Kruglanski et al., 2022). This concept has been recently referred to as ‘dark mattering’ (Flett et al., 2023), suggesting a form of mattering potentially influenced by sub-clinical antagonism and callousness (Paulhus & Williams, 2002). To address this hypothesis, the current research will model the relationships between mattering, purpose-in-life, and two key antagonistic personality traits – psychopathy and narcissism – that are hypothesized to play a role in dark mattering.

Psychopathy is generally defined in terms of lack of empathy, uncontrolled behavior, and anti-social disposition, further distinguished into primary and secondary types (Levenson et al., 1995). Primary psychopathy is characterized by a distorted sense of self-esteem and unstable self-worth (Falkenback et al., 2013), which may contribute to a negative association with mattering. In contrast, secondary psychopathy, marked by high impulsivity and low capacity for goal-setting capacity (Levenson et al., 1995), may be associated with low purpose-in-life. Narcissism, in turn, is characterized by an inflated self-image, often accompanied by a strong need for attention from others. It is commonly distinguished into two forms: Grandiose narcissism, characterized by dominance and immodesty, and vulnerable narcissism, characterized by introversion and need for recognition (Miller et al., 2011). An excessive need to matter may therefore be associated with narcissism, although research has indicated mixed evidence in the relationship between the two constructs, possibly exacerbated by measurement issues. For example, a positive association was found between anti-mattering (i.e., feeling insignificant because of neglect or others’ adverse actions) and both grandiose and vulnerable narcissism measured through the Pathological Narcissism Inventory (Pincus et al., 2009), while a negative association was found between general mattering and vulnerable narcissism, but not grandiose narcissism (Flett, 2022). Conversely, other studies found a positive relationship between purpose-in-life and sub-clinical narcissism (Velji & Schaermer, 2024), which is consistent with evidence from other recent research showing a protective role of narcissism for depressive symptoms. In this regard, it has been hypothesized that individuals with high levels of narcissism may foster greater self-esteem, which could, in turn, enhance their ability to cope with life adversities and threats to self-worth (Papageorgiou et al., 2019). Considering these promising but mixed findings, the present research will contribute to clarify the relationships between mattering, purpose-in-life, adaptive and antagonistic personality.

## Sex differences in mattering and purpose-in-life

Evidence is inconsistent on whether mattering varies by sex. In this regard, a longitudinal study found that mattering in men manifests as a mixture of feelings of support and mastery in the context of their workplace, whilst in women, despite the comparatively higher levels of mattering, stronger associations between mattering and depression were found (Taylor & Turner, 2001). This suggests that women may place greater emotional investment in their perceived importance to others, resulting in stronger emotional responses. Other studies in adolescent samples found that females perceive themselves as mattering to their families more than males do (Raye, 2005). However, other studies reported no differences between men and women in their perception of mattering to others (Dixon et al., 2009), making further research needed to elucidate sex differences in mattering. Regarding sex differences in purpose-in-life, research is scarce, and extant studies revealed contrasting findings. For example, in one study, a lack of purpose-in-life was associated with increased substance abuse in women and suicide ideation in men (Harlow et al., 1986) whilst in another study, purpose-in-life negatively correlated with suicidal ideation in both sexes, though a stronger association was observed in women vs. men (Edwards & Holden, 2001). Overall, based on these findings, further research is needed to improve our understanding of whether and to what extent purpose-in-life varies across sexes, and in particular, to clarify sex differences in the relationships between mattering, purpose-in-life, and personality.

## The present research

Despite the evidence accumulated thus far about the role mattering and purpose-in-life in individuals’ life satisfaction and wellbeing, several questions remain unanswered about the relationships between the two constructs, their associations with personality, and sex differences in these associations. The current work used three parallel studies, to: (i) Test the correlation between mattering and purpose-in-life – which, given their conceptual links, was hypothesized to be positive and ranging from moderate to high – and sex differences in their correlation. (ii) Test the factorial invariance of the measurement model of general mattering and purpose-in-life by sex, explore sex differences in factor covariance, and test whether and to what extent the Big-Five traits would predict mattering and purpose-in-life, hypothesizing that comparatively higher scores in agreeableness, conscientiousness, extraversion, openness to experience, and lower scores in neuroticism would predict

higher mattering and purpose-in-life, reflecting a personality profile characterized by resilience, self-confidence, and emotional stability, all characteristics commonly displayed by individuals scoring highly in mattering. However, based on evidence from the reported literature, those relationships were expected to be low to moderate (Flett et al., 2016; Flett, 2022). (iii) Test whether and to what extent different sub-types of psychopathy (primary, secondary) and narcissism (grandiose, vulnerable) would predict mattering and purpose-in-life. Specifically, this study hypothesized that grandiose, but not vulnerable narcissism would predict both mattering and purpose-in-life, suggesting that narcissistic positive self-perceptions would enhance individuals' sense of mattering and amplify their perception of own accomplishments and life roles. Furthermore, primary psychopathy was expected to be negatively associated with mattering, reflecting theoretical and empirical associations between a distorted self-worth, self-esteem, and the two constructs under investigation, while secondary psychopathy to be negatively associated with purpose-in-life, reflecting short-termed decision-making and goal-orientation dispositions commonly displayed by individuals high in this trait. The path models in studies 2 and 3 also controlled for the possible confounding effect of age and tested for sex differences. Indeed, exploring age and sex differences was critical in our research, since mattering, purpose-in-life, and personality are all linked to individuals' functioning and resilience, potentially leading to different outcomes for men and women across various stages of life. Understanding these differences may shed light on sex-specific relationships between these variables, leading to an improved understanding of the role of mattering and purpose-in-life in individuals' well-being and allowing for tailored intervention across various settings.

## Study 1

### Methods

#### Participants and procedure

Participants (474 men and 432 women) were first-year management and organizational studies students at a university in Central Canada. Their average age was 19.33 years ( $SD = 1.11$ ), ranging from 17 to 38 years. In exchange for their participation in this study, participants were compensated with one research credit towards their course requirements. The study was conducted through *Qualtrics* requiring about 10 min to be completed. Informed consent was obtained from all participants. All procedures were compliant with relevant laws and institutional guidelines,

approved by the institutional committee of the third and fifth authors.

### Measures

The *General Mattering Scale* (GMS; DeForge & Barclay, 1997) measured the degree to which an individual believes that they matter to significant others in their lives. This consists of five items (e.g., "I feel important to others"), measured on a Likert scale ranging between 1 (*not at all*) to 4 (*very much*). In the current study, the measure showed satisfactory reliability (Cronbach's  $\alpha = 0.81$ ; Omega = 0.81). The *Purpose-in-Life Scale* (Hill et al., 2016) measured the degree to which an individual feels that their lives have a central aim that provides a sense of meaning for them. It consists of four items, such as "I have direction in my life", rated on a Likert scale ranging between 1 (*strongly disagree*) and 5 (*strongly agree*). The scale showed satisfactory reliability (Cronbach's  $\alpha = 0.85$ ; Omega = 0.85). Lastly, participants in all studies were asked to self-report their biological sex. Guidelines and checklist from the *Sex and Gender Equity in Research* (SAGER) were used in reporting (Heidari et al., 2016).

### Analytic approach

Pearson's product-moment coefficient was used for bivariate correlations. Sex differences in correlations were investigated through Fisher's independence  $z$ -test, with values converted to  $z$ -scores using Fisher's  $r$ -to- $z$  test. Data from Study 1 is available upon request. Data from studies 2 and 3 and all code for the analyses can be found at: [https://osf.io/rg4qt/?view\\_only=fda3f7ab5ade4163b556af8ca1508ef3](https://osf.io/rg4qt/?view_only=fda3f7ab5ade4163b556af8ca1508ef3).

## Results

Women ( $M = 14.70$ ,  $SD = 2.96$ ) scored lower than men ( $M = 15.14$ ,  $SD = 3.59$ ) in purpose-in-life ( $t = -2.50$ ,  $p < .01$ ) but not in mattering (respectively:  $M = 14.65$ ,  $SD = 2.78$  vs.  $M = 14.48$ ,  $SD = 3.35$ ). The overall correlation between mattering and purpose-in-life was 0.46 ( $p < .001$ ). In women, the correlation was 0.43 ( $p < .001$ ), in men, 0.47 ( $p < .001$ ). No significant difference was found between women and men (Fisher's  $z = 0.75$ ,  $p = .45$ ).

## Study 2

### Methods

#### Participants and procedure

Participants were from two samples. The first sample ( $N_1=400$ ) included 190 women aged 20–72 years ( $M=34.30$ ;  $SD=10.90$ ) and 210 men aged 21–72 ( $M=34.00$ ;  $SD=8.06$ ). The second sample ( $N_2=178$ ) included 145 women aged 18–54 years ( $M=21.20$ ;  $SD=5.79$ ) and 33 men aged 19–40 ( $M=21.70$ ;  $SD=5.30$ ). Participants in the first sample were recruited online via *Amazon Mechanical Turk* from the adult population across various countries, being compensated with \$1.50 for their participation. Participants in the second sample were undergraduate psychology students from a university in Northern England, UK, recruited at the end of classroom lectures and invited to participate in the study voluntarily. In both cases, inclusion criteria required participants to be over 18 years old and self-reportedly fluent in English to ensure they could complete the procedure. Both procedures involved completing an online survey, respectively through *JISC* and *Qualtrics*, lasting approximately 15 min. Data from the two samples were pooled ( $N=578$ ) for measurement invariance testing. The first sample was used in Study 2 for testing the hypotheses on the Big-Five, whilst the second sample was used in Study 3 for testing hypotheses on antagonistic traits.

#### Measures

In addition to the GMS (Cronbach's  $\alpha=0.72$ ; Omega=0.72) and PILS (0.67, 0.77), participants in Study 2 completed the *Big-Five Inventory* (BFI; John & Srivastava, 1999), a 44-item measure of agreeableness (0.69, 0.69), conscientiousness (0.58, 0.58), extraversion (0.60, 0.56), neuroticism (0.68, 0.74), and openness to experience (0.70, 0.69). Each trait was measured by a number of items ranging between eight to 10 (e.g., “I am one who is emotionally stable, not easily upset”), all rated on a scale from 1 (*disagree strongly*) to 5 (*agree strongly*).

#### Analytic approach

Studies 2 and 3 used Spearman's correlation coefficient, and path analysis through Structural Equation Modelling (SEM). To cope with violations of the assumption of multivariate normality, MLR estimation was used (Satorra & Bentler, 1994). The invariance of the latent model including GMS and PILS scores was tested using multiple-group Confirmatory Factor Analysis (CFA). Parameters were initially freely estimated in both groups (configural model), then

progressively constrained to equality to test for *metric* (factor loadings constrained to equality), *scalar* (factor loadings and intercepts constrained), and *strict* invariance (factor loadings, intercepts, and residuals constrained). Differences of 0.010 in the Comparative Fit Index (DCFI), 0.015 (for metric, 0.010 for scalar and strict) in the Root Mean Square Error of Approximation (DRMSEA), and 0.030 (for metric, 0.015 for scalar and strict) in the Standardized Root Mean Square Residual index (SRMR) were used as cut-off criteria for invariance (Chen, 2007; Rutkowski & Svetina, 2014). Factor covariance between women and men was examined by comparing the strict invariant model with a model including additional constraints upon factor covariance (likelihood ratio test with Satorra and Bentler's, 2001 scaling correction, at  $\alpha=0.05$ ).

Path analysis was conducted in the first sample ( $N_1=400$ ), on total scales' scores, obtained by averaging across individual item's scores. Estimates across all models were adjusted according to the observed variables' omega reliability scores (Hayduk, 1987). Sex differences across paths were explored by means of multiple-group analysis and likelihood ratio tests ( $\alpha=0.05$ ). Standardized Monte Carlo 95% confidence intervals were estimated through 5,000 repetitions and *False Discovery Rate* adjustment ( $p_{FDR}$ ) was applied to  $p$ -values to control for multiple paths being tested simultaneously. The analyses were conducted in *R* (R Core Team, 2023) and RStudio (Posit team, 2023), using the *lavaan* (Rosseel, 2012), *MBESS* (Kelley, 2022), *psych* (Revelle, 2023), and *semTools* (Jorgensen et al., 2022) packages. Sensitivity analysis for a test of close fit, based on the proportion of sampling distribution of the RMSEA ( $H_0=0.05$ ,  $H_1=0.08$ ,  $df=24$ ) indicated a minimum requirement of 375 cases (0.80 power, 0.05  $\alpha$ ).

## Results

Table 1 presents descriptive statistics and zero-order correlations.

Violations of multivariate normality ( $N_1=400$ ;  $b_{lp}=730.89$ ,  $p<.001$ ) were found in the first sample. Multiple-group CFA showed values of DCFI, DRMSEA, and DSRMR within cut-off values for invariance, indicating no sufficient evidence of difference in measurement between women and men in GMS and PILS (Table 2), in loadings, intercepts, or residuals. Nevertheless, relatively high RMSEA values were observed across all models, indicating potential issues with general model fit. No difference was found between the strict model and a model with constrained latent variances (*Chi-Square difference*<sub>(df)</sub>=1.22<sub>(2)</sub>,  $p=.542$ ). A significant difference



**Table 1** Study 2. Descriptive statistics (N1 = 400)

| Variable             | M    | SD   | Omega (MLR) |           | 1. 2. 3. 4. 5. 6. 7. |         |         |         |         |         |         |         |
|----------------------|------|------|-------------|-----------|----------------------|---------|---------|---------|---------|---------|---------|---------|
|                      |      |      | Estimate    | 95% Lower | 95% Upper            | 1.      | 2.      | 3.      | 4.      | 5.      | 6.      | 7.      |
| 1. Mattering         | 3.12 | 0.49 | 0.72        | 0.66      | 0.78                 |         | 0.54*** | 0.59*** | 0.59*** | 0.53*** | 0.43*** | 0.53*** |
| 2. Purpose-in-life   | 4.08 | 0.61 | 0.77        | 0.70      | 0.84                 | 0.59*** |         | 0.40*** | 0.38*** | 0.29*** | 0.24*** | 0.36*** |
| 3. Agreeableness     | 3.81 | 0.52 | 0.69        | 0.64      | 0.75                 | 0.33*** | 0.37*** |         | 0.84*** | 0.83*** | 0.77*** | 0.86*** |
| 4. Conscientiousness | 3.77 | 0.54 | 0.58        | 0.47      | 0.69                 | 0.35*** | 0.30*** | 0.78*** |         | 0.89*** | 0.85*** | 0.86*** |
| 5. Extraversion      | 3.74 | 0.56 | 0.56        | 0.47      | 0.65                 | 0.30*** | 0.24*** | 0.72*** | 0.80*** |         | 0.87*** | 0.83*** |
| 6. Neuroticism       | 3.66 | 0.67 | 0.74        | 0.70      | 0.77                 | 0.17*   | 0.10    | 0.64*** | 0.74*** | 0.73*** |         | 0.84*** |
| 7. Openness          | 3.80 | 0.52 | 0.69        | 0.62      | 0.75                 | 0.32*** | 0.29*** | 0.80*** | 0.75*** | 0.72*** | 0.73*** |         |

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Lower triangle reports correlations for women, the upper triangle for men

was found in factor covariance ( $7.69_{(1)}$ ,  $p = .006$ ) between women ( $r = .62$ ,  $SE = 0.05$ ,  $p < .001$ ) and men ( $r = .82$ ,  $SE = 0.05$ ,  $p < .001$ ).

The results of path analysis showed significant paths between mattering and, respectively, conscientiousness ( $b = 0.30$ ,  $SE = 0.11$ ,  $p_{FDR} = 0.002$ ) and neuroticism ( $b = -0.24$ ,  $SE = 0.06$ ,  $p_{FDR} < 0.001$ ); additionally, between purpose-in-life and, respectively, agreeableness ( $b = 0.40$ ,  $SE = 0.15$ ,  $p_{FDR} = 0.004$ ), neuroticism ( $b = -0.28$ ,  $SE = 0.07$ ,  $p_{FDR} < 0.001$ ), and conscientiousness ( $b = 0.27$ ,  $SE = 0.13$ ,  $p_{FDR} = 0.017$ ). No significant association was found between age and either mattering or purpose-in-life, nor were any significant differences observed across all paths ( $Chi-Square$  difference<sub>(df)</sub> = 19.01<sub>(13)</sub>,  $p = .123$ ). Detailed results are reported in Table 3.

### Study 3

#### Methods

**Participants and procedure** Participants in Study 3 were from the second sample ( $N_2 = 178$ ). The procedure is described in detail in the previous paragraphs. Sensitivity analysis for a test of close-fit, based on the proportion of sampling distribution of the RMSEA ( $H_0 = 0.05$ ,  $H_1 = 0.08$ ,  $df = 18$ ) indicated a minimum requirement of 475 cases (0.80 power, 0.05 alpha).

#### Measures

In addition to GMS (Cronbach's alpha = 0.80; Omega = 0.81) and PILS (0.90, 0.90), primary and secondary psychopathy were assessed through Levenson et al.'s (1995) *Self-Report Psychopathy Inventory*, a 26-item measure of primary psychopathy, i.e., antagonistic and callous dispositions, and secondary psychopathy, i.e., impulsive and antisocial facets. Items (e.g., "In today's world, I feel justified in doing anything I can get away with to succeed") are rated from 1 (*disagree strongly*) to 4 (*agree strongly*). Reliability scores for primary psychopathy were, respectively for Cronbach's alpha and omega, 0.69 and 0.70; 0.67 and 0.69 for secondary psychopathy. The *Narcissistic Personality Inventory* (Raskin & Terry, 1988) measured grandiose narcissism (Cronbach's alpha = 0.68; Omega = 0.68). Items (e.g., "I usually get the respect I deserve") are rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Total scores represent a dimension of grandiose narcissism, underling an exaggerated or grandiose sense of self. The *Hypersensitive Narcissism Scale* measured vulnerable narcissism (Hendin & Cheek, 1997), including ten items (e.g., "My feelings are easily hurt by ridicule or the slighting remarks of others")

**Table 2** Study 2. Invariance testing ( $N=578$ )

| Model      | Chi-Square <sub>scaled</sub> | df <sub>scaled</sub> | $p$ -value <sub>scaled</sub> | CFI <sub>robust</sub> | RMSEA <sub>robust</sub> | SRMR  | DCFI   | DRMSEA | DSRMR  |
|------------|------------------------------|----------------------|------------------------------|-----------------------|-------------------------|-------|--------|--------|--------|
| Configural | 163.19                       | 52                   | <0.001                       | 0.941                 | 0.093                   | 0.044 |        |        |        |
| Metric     | 189.98                       | 59                   | <0.001                       | 0.932                 | 0.094                   | 0.057 | −0.009 | 0.001  | 0.014  |
| Scalar     | 211.57                       | 66                   | <0.001                       | 0.926                 | 0.093                   | 0.060 | −0.006 | −0.001 | 0.003  |
| Strict     | 239.90                       | 75                   | <0.001                       | 0.917                 | 0.092                   | 0.059 | −0.009 | −0.001 | −0.001 |

**Table 3** Study 2. Results from path analysis ( $N1=400$ )

| Outcome         | Predictor         | b     | b     | SE   | 95% CI Lower | 95% CI Upper | $p$    | $p_{FDR}$ |
|-----------------|-------------------|-------|-------|------|--------------|--------------|--------|-----------|
| Mattering       | Agreeableness     | 0.20  | 0.18  | 0.10 | 0.01         | 0.36         | 0.046  | 0.099     |
|                 | Conscientiousness | 0.37  | 0.30  | 0.11 | 0.13         | 0.47         | <0.001 | 0.002     |
|                 | Extraversion      | 0.12  | 0.10  | 0.09 | −0.04        | 0.23         | 0.162  | 0.301     |
|                 | Neuroticism       | −0.26 | −0.24 | 0.06 | −0.35        | −0.13        | <0.001 | <0.001    |
|                 | Openness          | 0.07  | 0.07  | 0.10 | −0.10        | 0.24         | 0.441  | 0.696     |
|                 | Age               | 0.00  | 0.02  | 0.00 | −0.05        | 0.08         | 0.568  | 0.738     |
| Purpose-in-life | Agreeableness     | 0.47  | 0.40  | 0.15 | 0.16         | 0.65         | 0.001  | 0.004     |
|                 | Conscientiousness | 0.35  | 0.27  | 0.13 | 0.07         | 0.47         | 0.007  | 0.017     |
|                 | Extraversion      | −0.02 | −0.01 | 0.12 | −0.20        | 0.16         | 0.880  | 0.999     |
|                 | Neuroticism       | −0.32 | −0.28 | 0.08 | −0.41        | −0.16        | <0.001 | <0.001    |
|                 | Openness          | 0.00  | 0.00  | 0.13 | −0.22        | 0.23         | 0.994  | 0.999     |
|                 | Age               | 0.00  | 0.03  | 0.00 | −0.05        | 0.11         | 0.482  | 0.696     |

Note. Standardized 95% Confidence Intervals estimated through the Monte Carlo method (5,000 repetitions)

**Table 4** Study 3. Results from path analysis ( $N2=178$ )

|                          | M    | SD   | Omega (MLR) |           |           | 1.      | 2.       | 3.      | 4.      | 5.      | 6.      |
|--------------------------|------|------|-------------|-----------|-----------|---------|----------|---------|---------|---------|---------|
|                          |      |      | Estimate    | 95% Lower | 95% Upper |         |          |         |         |         |         |
| 1. Mattering             | 2.51 | 0.64 | 0.81        | 0.76      | 0.86      |         | 0.56***  | −0.02   | −0.05   | 0.00    | 0.54*** |
| 2. Purpose-in-life       | 3.52 | 1.01 | 0.90        | 0.88      | 0.93      | 0.37*** |          | −0.10   | −0.20   | −0.01   | 0.28    |
| 3. Primary Psychopathy   | 3.66 | 0.66 | 0.70        | 0.62      | 0.78      | −0.08   | −0.24**  |         | 0.19    | 0.26    | 0.27    |
| 4. Secondary Psychopathy | 4.07 | 0.84 | 0.68        | 0.60      | 0.77      | −0.23** | −0.29*** | 0.44*** |         | 0.58*** | 0.17    |
| 5. Vulnerable Narcissism | 5.43 | 1.27 | 0.77        | 0.70      | 0.84      | −0.27** | −0.17*   | 0.31*** | 0.43*** |         | 0.11    |
| 6. Grandiose Narcissism  | 4.59 | 1.10 | 0.68        | 0.61      | 0.75      | 0.41*** | 0.05     | 0.33*** | 0.17*   | 0.13    |         |

Note. \* $p<0.05$ ; \*\* $p<0.01$ ; \*\*\* $p<0.001$ . Lower triangle reports correlations for women, the upper triangle for men

that assess an overall dimension of self-centeredness associated with psychological insecurity and emotional instability (Cronbach's  $\alpha=0.78$ ; Omega=0.77). Scores range from 1 (*very uncharacteristic or untrue, strongly disagree*) to 5 (*very characteristic or true, strongly agree*).

### Analytic approach

Study 3 used the same analytic approach of Study 2. To avoid repetition, the readers are referred to previous paragraphs.

## Results

Multivariate normality was violated ( $b_{lp}=10.26$ ,  $p<0.001$ ). Table 4 presents descriptive statistics and Spearman's zero-order correlations.

Significant paths were found between mattering and, respectively, grandiose narcissism ( $b=0.26$ ,  $SE=0.03$ ,  $p_{FDR}$

< 0.001), primary psychopathy ( $b=-0.16$ ,  $SE=0.08$ ,  $p_{FDR}=0.033$ ), and secondary psychopathy ( $b=-0.14$ ,  $SE=0.07$ ,  $p_{FDR}=0.028$ ), after controlling for age, which in turn, was significantly associated with mattering ( $b=0.12$ ,  $SE=0.01$ ,  $p_{FDR}=0.004$ ). Significant paths were also found between purpose-in-life, and respectively, secondary psychopathy ( $b=-0.31$ ,  $SE=0.09$ ,  $p_{FDR}<0.001$ ) and grandiose narcissism ( $b=0.15$ ,  $SE=0.06$ ,  $p_{FDR}=0.012$ ). No association was found between purpose-in-life and age (Table 5), nor were any significant differences observed across all paths ( $\chi^2_{(df)}=9.96$ ,  $p=.534$ ).

### General discussion

The current research investigated the relationship between mattering and purpose-in-life, their associations with adaptive and antagonistic traits, and sex differences in these associations. Specifically, Study 1 examined the correlation between mattering and purpose-in-life between women

**Table 5** Study 3. Results from path analysis ( $N_2 = 178$ )

| Outcome         | Predictor             | b     | b     | SE   | 95% CI Lower | 95% CI Upper | <i>p</i> | <i>p</i> <sub>FDR</sub> |
|-----------------|-----------------------|-------|-------|------|--------------|--------------|----------|-------------------------|
| Mattering       | Primary Psychopathy   | −0.18 | −0.16 | 0.08 | −0.29        | −0.03        | 0.018    | 0.033                   |
|                 | Secondary Psychopathy | −0.17 | −0.14 | 0.07 | −0.26        | −0.03        | 0.013    | 0.028                   |
|                 | Vulnerable Narcissism | −0.02 | −0.02 | 0.05 | −0.12        | 0.07         | 0.653    | 0.718                   |
|                 | Grandiose Narcissism  | 0.30  | 0.26  | 0.03 | 0.20         | 0.31         | <0.001   | <0.001                  |
|                 | Age                   | 0.02  | 0.12  | 0.01 | 0.04         | 0.20         | 0.001    | 0.004                   |
| Purpose-in-life | Primary Psychopathy   | −0.19 | −0.15 | 0.14 | −0.37        | 0.06         | 0.164    | 0.226                   |
|                 | Secondary Psychopathy | −0.39 | −0.31 | 0.09 | −0.45        | −0.17        | <0.001   | <0.001                  |
|                 | Vulnerable Narcissism | 0.08  | 0.07  | 0.08 | −0.07        | 0.20         | 0.354    | 0.433                   |
|                 | Grandiose Narcissism  | 0.19  | 0.15  | 0.06 | 0.05         | 0.25         | 0.004    | 0.012                   |
|                 | Age                   | 0.02  | 0.12  | 0.01 | 0.01         | 0.23         | 0.047    | 0.074                   |

Note. Standardized 95% Confidence Intervals estimated through the Monte Carlo method (5,000 repetitions)

and men, with results showing a positive moderate correlation between mattering and purpose-in-life, equally for both sexes, suggesting that maintenance of both mattering and purpose-in-life may be key to ensuring a positive sense of life significance, satisfaction, and direction. Study 2 showed mixed evidence regarding the sex-invariance of the measurement model, specifically at the levels of factor loadings, intercepts, and residuals, with fit indices potentially indicating issues with general model fit. Further tests revealed no differences in latent variance but a significant difference in factor covariance between women and men: In fact, the covariance between mattering and purpose-in-life was lower women compared to men. However, considering the aforementioned issues with general model fit, caution is advised when interpreting these results. Moreover, Study 2 indicated neuroticism and conscientiousness as significant predictors of mattering and purpose-in-life, respectively negatively and positively predicting scores in both mattering and purpose-in-life, whereas agreeableness was found to positively predict purpose-in-life but not significantly mattering. No sex differences were found across the paths estimated in Study 2. Study 3 showed that grandiose – but not vulnerable – narcissism positively predicts mattering and purpose-in-life, that primary and secondary psychopathy negatively predict mattering, and that secondary psychopathy negatively predicts purpose-in-life, after controlling for age, which was found to be positively associated with mattering, too.

Because both mattering and purpose-in-life concern individuals' sense of life significance, it is not surprising that, in the current study, a positive association was observed between them, which aligns with evidence from previous research (Dixon, 2007; France & Finney, 2009). Indeed, evidence from multiple sources now suggests that higher levels of mattering are associated with greater well-being and adjustment, including protection against the development of anxiety, depression, and other psychopathological symptoms (Flett et al., 2012; Joeng & Turner, 2015a, b). Similarly, purpose-in-life is associated with positive effects

on psychosocial well-being, physical health, and negative effects on suicidal ideation and the development of depression (Hedberg et al., 2010; Heisel & Flett, 2004; Kim et al., 2021; Stoyles et al., 2015). Overall, given the findings from previous studies and the results of the present research, it stands to reason that purpose-in-life and mattering are solidly linked, with high scores in both likely associated with an adaptive personality structure.

In fact, results from the present research align with findings from recent investigations (e.g., Flett et al., 2016; Flett, 2022; Hill et al., 2016). Specifically, they suggest a significant although relatively low association between the Big-Five, mattering, and purpose-in-life, and they clarify that such associations do not vary between sexes. In particular, the relationship between conscientiousness and the two constructs may be explained by the disposition towards competence, organization, and achievement orientation that is commonly observed individuals high in conscientiousness. In turn, the findings relevant to neuroticism may be explained by the tendency towards anxiety, depression, low self-esteem and self-confidence often displayed by individuals with high neuroticism scores. Interestingly, agreeableness, but not extraversion, was positively associated with purpose-in-life. This finding is of particular interest, considering the recently hypothesized negative relationship between antagonistic personality and purpose-in-life, and the negative correlation between agreeableness and 'dark' or antagonistic traits discussed in previous literature (e.g., Jonason et al., 2013). Trust, optimism, and orientation to altruism might explain this pattern, with agreeableness possibly conferring an advantage through facilitating interpersonal agency, potentially acting as a protective factor against stressors and adversities. However, considering previous research showing positive associations between correlation and mattering (Flett et al., 2016), further investigation in larger and diverse samples is warranted.

The presented findings also support the hypothesis that grandiose narcissism might function as a protective factor towards one's self-worth, possibly providing a defense



against life stressors and a personal sense of meaning and purpose-in-life. In contrast, dysfunctional self- and other-perceptions typically found in both psychopathy types could explain their negative paths observed in relation to mattering, whereas impulsivity and lack of higher self-regulatory functions could explain the link between secondary – but not primary – psychopathy and purpose-in-life. Furthermore, the lack of evidence about links between mattering, purpose-in-life, and vulnerable narcissism are of particular interest. Indeed, the results of the present research challenge the view that vulnerable narcissists may be overly concerned with their own sense of mattering or purpose-in-life, potentially suggesting more subtle pathways to callous affect and manipulateness individuals with high scores in vulnerable narcissism. For example, self-victimization and interpersonal dependency typically observed in individuals high in vulnerable narcissism may represent manipulative devices rather than interiorized perceptions of no or even low mattering. Consistently, despite the limitations of the present research, these results expand on the emerging literature on the idea of a ‘dark mattering’ and individual adjustment, suggesting distinct patterns for specific traits and warranting further investigation for future advancement of theory and community-based intervention.

Lastly, the stronger correlation between mattering and purpose-in-life found in men compared to women aligns with previous evidence suggesting that men placing greater emphasis on their feelings of mattering, especially in areas such as workplace mastery and success, compared to women (Taylor & Turner, 2001). Consistently, given the demographics of participants in the present research, the result could indicate that men place greater value on educational attainments than women, perhaps being influenced by societal norms and expectations, reflective of the success-driven culture within academic institutions, while women may be more concerned with mattering when related to emotional aspects. These results are clearly promising. Indeed, if confirmed, they could pave the way to sex- and gender-specific interventions in counseling, educational, and workplace settings, for instance, by acknowledging and leveraging on sex differences in the relationship between mattering, purpose-in-life, and wellbeing. Moreover, as suggested in Flett’s (2022) recent review and evaluation on the literature on mattering, the use of person-centered models may facilitate the understanding of whether these differences could interplay with specific personality profiles.

However, sex differences in mattering and purpose-in-life should be explored in greater depth for more conclusive insights into sex-specific patterns and their underlying mechanisms, especially considering the mixed findings found between studies in the present work and the ones from previous research. Should future research confirm

sex differences in mattering and/or purpose-in-life, and in their associations with personality, a revision of the current assessment of both constructs may be required. For example, custom items could be devised to differentially target them in women and men, perhaps by accounting for societal norms and expectation, different levels of interiorizations of those norms, and their interplay with individual differences, as well as biological variations at various stages of life. Moreover, further research is required to gain a better understanding of how the relationship between the two constructs differs across other demographic characteristics, which were not considered in the present work, and examine their stability across a range of different cultural contexts and applied settings. Indeed, cross-cultural specificities in sex differences cannot be ruled out, either, potentially reflecting a diversity of societal expectations that could make mattering and purpose-in-life vary across sexes as a function of the specific context of investigation.

## Implications

These findings have several important implications. First, the associations between mattering, purpose-in-life, and adaptive personality traits such as high conscientiousness and emotional stability vs. low psychopathy challenge the recently advanced hypothesis of a potential detrimental effect of mattering and of the very concept of ‘dark mattering’. However, in this respect, issues at the level of measurement of these traits cannot be ruled out. Indeed, it is possible that in the present research, the brief measures of general mattering and purpose-in-life could not capture the established context-specific nature of these constructs or the range of facets and nuances that characterize them (see Flett, 2022, for a review). A secondary implication of this is that prevention and intervention in the community may benefit from a careful selection of measures when assessing mattering and purpose-in-life, potentially contemplating the use of multiple inventories to tackle unresolved validity issues associated with brief inventories. Second, these results align with the view that grandiose narcissisms may play a protective role in individuals’ wellbeing, as discussed in recent literature (e.g., Papageorgiou et al., 2019). The accumulating evidence on this association is promising, and the present research adds further information by suggesting that the self-centered nature of grandiose narcissism is associated with individuals’ capacity to preserve positive self-perceptions, which in turn, could help them cope with external stressors and maintain an adaptive and resilient profile. This is especially informative for intervention in community settings, whereby individuals high in narcissism may not require interventions targeting self- but rather

other-perceptions, in particular, those that play a role in manipulateness or callous affect and behavior.

However, importantly, the present research did not untangle different sources of variance in the way these constructs were measured, potentially including impression management and social desirability, which in turn, are highly relevant for the measurement of narcissism, as well as of personality in general. For this reason, future research should consider the relationship between mattering, purpose-in-life, and narcissism more accurately, possibly using narrowband measures to tackle the complexity of the associations across facets of these constructs. Nevertheless, these results highlight the importance of considering mattering and purpose-in-life as important constructs in personality research, and potentially, for intervention. Indeed, it may be that mattering and purpose-in-life correspond to facets of resilient personalities, aligned with the established theoretical paradigm proposed by Block and Block (1980), or rather manifest as characteristic adaptations that influence behavior over time (Costantini & Perugini, 2018). Therefore, the role of mattering and purpose-in-life in intervention may be key, from informing personality development to addressing dysfunctional self- and other-perceptions that promote personal and professional development across various applied settings. For instance, in counseling, mattering and purpose-in-life could be leveraged to help clients enhance resilience and improve coping strategies. In educational settings, learners could be trained to harness mattering and purpose-in-life to strengthen academic self-efficacy, and in turn, improve educational outcomes. In organizational settings, could drive change by enhancing individuals' confidence, productivity, and leadership.

### Limitations and future directions of study

The convenience sampling strategy, the use of only two personality models, and the cross-sectional design represent limitations of the present work. Indeed, investigating mattering and purpose-in-life in relation to other traits such as Machiavellianism and sadism could offer further insight on the recently advanced concept of 'dark mattering'. Furthermore, the current work tested models of adaptive and antagonistic traits separately, with no mutual statistical control, which represents an important shortcoming that future studies should address. Nevertheless, considering the marginally acceptable fit of the latent models and potential issues associated with it, testing alternative models and specifications is warranted, aiming to better represent the latent structure of the constructs under investigation. Clearly, this was beyond the scope of the present study, which selected established measures to focus on their structural relationships. Nevertheless, these should be subject to additional scrutiny and

psychometric testing, perhaps by means of explorative techniques (e.g., ESEM) that could provide insight on sources of misfit, for example, identifying problematic items or correlated residuals, and suggesting improvements.

Another important caveat when interpreting these results is that mattering could vary according to age, as identified in Study 3. Indeed, an individual's sense of mattering and purpose-in-life could change depending on perceived age-specific life milestones and their accomplishment, potentially influencing the way individuals interpret questions geared towards personal significance and life direction. In addition, an interaction between sex and age in mattering and purpose-in-life cannot be ruled out, and although it was not explored in the present work, future research would benefit from examining how life events such as job loss and career adversity differentially impact women and men at various stages of life. Preliminary findings indicated that men place more of their personal value in their career success; likewise, given prior research that suggests women place more personal value in emotionally driven situations, emotion-driven contexts may provide evidence for a stronger relationship between mattering and purpose-in-life in women than in men. The pursuit of these areas would be of value, as it would allow employers, educators, and mental health professionals to tailor strategies to reinforce mattering and purpose-in-life across a variety of contexts. In turn, this could improve individuals' wellbeing and life satisfaction and support long-term fulfilment. Lastly, but importantly, a wide range of unmeasured variables (e.g., cultural background, social support) may affect the validity of the results. Future research would benefit from designs that account for and control their influence.

### Conclusion

The present work indicates a positive relationship between mattering and purpose-in-life, as well as their association with adaptive and antagonistic personality traits, in particular, conscientiousness, grandiose narcissism, and (negatively) neuroticism and psychopathy. Furthermore, the correlation between mattering and purpose-in-life was higher in men, although evidence was mixed across studies. These results contribute to theory and research in personality and individual differences and suggest possible avenues for intervention across various settings, while emphasizing the need for further research that considers the relationship between constructs across sexes and at different stages individuals' life.

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**Data availability** The code used for the analyses presented in the current research are available in the Open Science Framework, at: [https://osf.io/rg4qt/?view\\_only=fda3f7ab5ade4163b556af8ca1508ef3](https://osf.io/rg4qt/?view_only=fda3f7ab5ade4163b556af8ca1508ef3)

## Declarations

**Ethics approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Study 1 was approved by the Ethics Committee of the University of Western Ontario, Faculty of Social Science, Canada. Studies 2 and 3 were approved by the University of Salford Ethics Committee.

**Consent** Informed consent was obtained from all individual participants included in the study.

**Data** The datasets analyzed during the current research are available in the Open Science Framework, at: [https://osf.io/rg4qt/?view\\_only=fda3f7ab5ade4163b556af8ca1508ef3](https://osf.io/rg4qt/?view_only=fda3f7ab5ade4163b556af8ca1508ef3).

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