

# Refining the Vulnerability Model of Low Self-Esteem and Depression: Disentangling the Effects of Genuine Self-Esteem and Narcissism

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A growing body of research supports the vulnerability model of low self-esteem and depression, which states that low self-esteem is a risk factor for depression. The goal of the present research was to refine the vulnerability model, by testing whether the self-esteem effect is truly due to a lack of genuine self-esteem or due to a lack of narcissistic self-enhancement. For the analyses, we used data from 6 longitudinal studies consisting of 2,717 individuals. In each study, we tested the prospective effects of self-esteem and narcissism on depression both separately for each construct and mutually controlling the constructs for each other (i.e., a strategy that informs about effects of genuine self-esteem and pure narcissism), and then meta-analytically aggregated the findings. The results indicated that the effect of low self-esteem holds when narcissism is controlled for (uncontrolled effect =  $-.26$ , controlled effect =  $-.27$ ). In contrast, the effect of narcissism was close to zero when self-esteem was controlled for (uncontrolled effect =  $-.06$ , controlled effect =  $.01$ ). Moreover, the analyses suggested that the self-esteem effect is linear across the continuum from low to high self-esteem (i.e., the effect was not weaker at very high levels of self-esteem). Finally, self-esteem and narcissism did not interact in their effect on depression; that is, individuals with high self-esteem have a lower risk for developing depression, regardless of whether or not they are narcissistic. The findings have significant theoretical implications because they strengthen the vulnerability model of low self-esteem and depression.

*Keywords:* self-esteem, narcissism, depression, longitudinal, meta-analysis

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Many theories of depression posit that low self-esteem is a vulnerability factor that is involved in the etiology of depressive disorders (e.g., Abramson, Seligman, & Teasdale, 1978; Beck, 1967). In recent years, an emerging body of longitudinal studies has supported the vulnerability model of low self-esteem and depression (for a review, see Orth & Robins, 2013). A meta-analysis of the available evidence suggested that the vulnerability model is highly robust, holding across a wide range of samples and design characteristics (Sowislo & Orth, 2013). Moreover, the evidence suggests that the vulnerability effect is not spurious. Specifically, the effect holds after controlling for theoretically

relevant factors (e.g., stressful life experiences) that might lead to both low self-esteem and depression (Orth, Robins, & Meier, 2009; Orth, Robins, Widaman, & Conger, 2014; Sowislo, Orth, & Meier, 2014).

However, one important possible confound has yet to be explored. As we will review in more detail below, a general issue in research on self-esteem is that the construct of self-esteem partially overlaps with narcissism given that both constructs involve positive self-evaluations (Bosson et al., 2008; Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004). Hence, are individuals with low self-esteem at greater risk for depression because they lack genuine self-esteem or because they lack a healthy dose of narcissistic self-enhancement? A straightforward way to disentangle the effects of self-esteem and narcissism is to assess both constructs and mutually control their effects when predicting an outcome (Paulhus, Robins, Trzesniewski, & Tracy, 2004). It is important to note that the meaning of self-esteem and narcissism changes when the two constructs are controlled for each other. Then, measures of self-esteem can be interpreted as genuine self-esteem (i.e., self-esteem that is free from narcissistic self-enhancement), whereas measures of narcissism can be interpreted as pure narcissism (i.e., narcissism that is free from healthy self-esteem). The goal of the present research was to refine the vulnerability model by testing whether the link between low self-esteem and depression holds

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when narcissism is controlled for. To strengthen the reliability and generalizability of the findings, we used data from six longitudinal studies, all of which included measures of self-esteem, narcissism, and depression.

### The Vulnerability Model of Low Self-Esteem and Depression

The vulnerability model states that low self-esteem is a risk factor for depression (Beck, 1967; Metalsky, Joiner, Hardin, & Abramson, 1993; Roberts & Monroe, 1992; Zeigler-Hill, 2011). For example, in his cognitive theory of depression, Beck (1967) hypothesized that negative beliefs about the self are not just a symptom of depression but play a critical causal role in its etiology. In addition to the vulnerability model, the scar model has been proposed to explain why low self-esteem and depression are related. In the scar model, low self-esteem is conceptualized as a consequence, rather than a cause, of depression, because experiences of depression may lead to permanent changes (i.e., “scars”) in the individual’s self-concept (Coyne, Gallo, Klinkman, & Calarco, 1998; Shahar & Davidson, 2003). It should be noted that the vulnerability model and scar model are not mutually exclusive because both processes (i.e., low self-esteem contributing to depression and depression eroding self-esteem) might operate simultaneously. Overall, findings from longitudinal studies (Orth et al., 2014; Orth, Robins, & Meier, 2009; Orth, Robins, & Roberts, 2008; Wouters et al., 2013) and from a meta-analysis of the available evidence (Sowislo & Orth, 2013) strongly support the vulnerability model and provide only weak support for the scar model.

#### Refining the Vulnerability Model

Given the strong support for the vulnerability model, researchers have tested the generalizability of the model. The results suggest that the vulnerability model holds for both men and women (Orth et al., 2008; Orth, Robins, Trzesniewski, Maes, & Schmitt, 2009; Sowislo & Orth, 2013) and for ethnic minority (e.g., Mexican-origin youth; Orth et al., 2014) as well as majority populations (Orth, Robins, Trzesniewski, et al., 2009; Steiger, Allemand, Robins, & Fend, 2014). Moreover, the model replicates for all age groups from childhood to old age (Orth, Robins, Trzesniewski, et al., 2009; Sowislo & Orth, 2013). Thus, although people’s average levels of self-esteem and depression change across the life span (Kessler, Foster, Webster, & House, 1992; Orth, Maes, & Schmitt, 2015; Orth, Trzesniewski, & Robins, 2010), the structural relations between self-esteem and depression do not change with age. The evidence also suggests that the vulnerability model holds for different measures of self-esteem and depression (Sowislo & Orth, 2013), after controlling for content overlap between self-esteem and depression measures (Orth et al., 2008; Orth, Robins, Trzesniewski, et al., 2009), and across time intervals ranging from 1 week to several years (Sowislo & Orth, 2013).

Researchers have begun to test mechanisms that might account for the vulnerability effect of low self-esteem. Using multiwave longitudinal data, Kuster, Orth, and Meier (2012) found that rumination partially mediated the effect of low self-esteem on depression; that is, low self-esteem prospectively predicted increases in rumination, and rumination prospectively predicted increases in

depression. Given that rumination only partially mediated the vulnerability effect, it is likely that additional mechanisms are involved. For example, a possible behavioral pathway is that low self-esteem leads to social avoidance, which may contribute to the development of depression through social isolation, loneliness, and diminished social support (Ottenbreit & Dobson, 2004). Furthermore, individuals with low self-esteem are prone to dampen positive affect and feel undeserving of positive outcomes, which may increase risk for depression (Wood, Heimpel, Manwell, & Whittington, 2009; Wood, Heimpel, & Michela, 2003). Knowledge about mediating processes that account for the vulnerability effect is critical because it informs possible starting points for interventions aimed at preventing or reducing depression.

Finally, researchers have investigated construct specifications of self-esteem and depression. For example, research suggests that the vulnerability model holds regardless of whether affective-cognitive or somatic symptoms of depression are examined (Kuster et al., 2012; Orth, Robins, Trzesniewski, et al., 2009). However, the evidence indicates that the vulnerability effect is due to specific characteristics of self-esteem. First, two studies suggested that the vulnerability effect is driven mostly by global rather than domain-specific self-esteem (Orth et al., 2014; Steiger et al., 2014). Second, analyses by Sowislo et al. (2014) suggested that the critical vulnerability factor is a low level of self-esteem rather than low stability (Kernis et al., 1998; Roberts & Gotlib, 1997) or high contingency of self-esteem (Crocker & Wolfe, 2001). The goal of the present research was to contribute to this line of studies by testing whether the vulnerability effect is due to genuine self-esteem or due to the confounding of self-esteem with narcissistic self-enhancement.

#### Disentangling the Effects of Self-Esteem and Narcissism

In the following, we first define the constructs of self-esteem and narcissism and then review research that disentangles the effects of the constructs. Self-esteem is defined as an “individual’s subjective evaluation of his or her worth as a person” (Donnellan, Trzesniewski, & Robins, 2011, p. 718). Self-esteem does not necessarily reflect a person’s objective talents and competencies. Moreover, self-esteem has been described by the feeling of self-acceptance and self-respect, but high self-esteem does not necessarily imply that the person believes he or she is superior to others (Rosenberg, 1965). Measures of self-esteem typically include statements such as “I feel that I am a person of worth, at least on an equal plane with others” and “On the whole, I am satisfied with myself” (the items are from the Rosenberg Self-Esteem Scale, RSE; Rosenberg, 1965). In contrast, the construct of narcissism is defined by characteristics such as a grandiose self-concept, feelings of superiority, self-centeredness, and sense of entitlement (Ackerman et al., 2011; Bosson et al., 2008; Morf & Rhodewalt, 2001). Similar to self-esteem, narcissism is typically conceived of as a dimensional construct that captures individual differences on a continuum from low to high (Foster & Campbell, 2007). The most frequently used measure is the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979), which requires respondents to choose among narcissistic and nonnarcissistic statements; examples of narcissistic statements are “If I ruled the world, it would be a much better place” and “I like to be the center of attention.”

The definitions illustrate that the constructs of both self-esteem and narcissism include positive self-evaluations and, consequently, show conceptual overlap. Correspondingly, measures of self-esteem and narcissism capture shared variance, correlating at about medium to large effect sizes. For example, in the studies by Ackerman et al. (2011); Brown and Zeigler-Hill (2004); Paulhus et al. (2004); and Kwan, Kuang, and Hui (2009), the correlation between self-esteem and narcissism ranged from .26 to .50. However, it is important to note that these correlations are not as strong as would be expected if self-esteem and narcissism were actually the same construct. Moreover, despite the fact that both constructs include positive self-evaluations, the constructs can be conceptually distinguished, given that self-esteem does not include a sense of superiority, entitlement, and self-centeredness. Thus, whereas narcissism implies that the individual generally feels superior and entitled to exploit others, high self-esteem does not imply a negative view of others, but is compatible with a positive, prosocial attitude toward others (Paulhus et al., 2004).

The difference between self-esteem and narcissism is supported by empirical studies showing that the two constructs have differential correlates with important outcomes. For example, whereas high self-esteem predicts low levels of antisocial behavior and hostility, high narcissism predicts high levels in these outcomes (Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Paulhus et al., 2004; Tracy, Cheng, Robins, & Trzesniewski, 2009). Moreover, whereas self-esteem shows a medium-sized to strong correlation with authenticity, the correlation for narcissism is small (Tracy et al., 2009). Furthermore, whereas high self-esteem cross-sectionally predicts better mental health, the effects are inconsistent for narcissism (Tracy et al., 2009).

The divergent effects of self-esteem and narcissism become even clearer when the two constructs are mutually controlled for each other. For example, in the study by Paulhus et al. (2004), the regression coefficient of self-esteem predicting antisocial behavior changed from essentially zero to about  $-.20$  when narcissism was controlled for (the effect sizes are averaged across the three samples tested by Paulhus et al., 2004). Moreover, the coefficient of narcissism predicting antisocial behavior changed from about .30 to .40 when controlling for self-esteem. Thus, the difference between the effects of self-esteem and narcissism became larger when the two constructs were mutually controlled for each other. Similar patterns of findings on effects of self-esteem and narcissism have been reported by Donnellan et al. (2005) and Tracy et al. (2009). Thus, by examining self-esteem and narcissism within the same model, the unique effects of self-esteem and narcissism become clearer. In statistical terms, this phenomenon is called a suppressor situation, which occurs when the “simultaneous inclusion of two predictors improves one or both validities” (i.e., increases the absolute size of the regression coefficients of one or both predictors; Paulhus et al., 2004, p. 305). As mentioned at the beginning of this article, the meaning of the constructs changes when the complementary construct is controlled for. Then, measures of self-esteem indicate genuine self-esteem, whereas measures of narcissism indicate pure narcissism.

Given the empirical and conceptual overlap between self-esteem and narcissism, and ongoing debates about the degree to which they are entirely distinct constructs, it is important to scrutinize the vulnerability model and unpack the self-esteem construct by empirically disentangling it from narcissism. The strategy of mutually

controlling complementary constructs for each other has been fruitful not only with regard to the independent effects of self-esteem and narcissism (Donnellan et al., 2005; Paulhus et al., 2004; Tracy et al., 2009) but also in research on independent effects of other pairs of constructs such as shame and guilt (Orth, Berking, & Burkhardt, 2006; Paulhus et al., 2004; Tangney, Wagner, Fletcher, & Gramzow, 1992; Tangney, Wagner, & Gramzow, 1992; Tracy & Robins, 2006) and authentic and hubristic pride (Orth, Robins, & Soto, 2010; Tracy et al., 2009). The need for disentangling the relations between self-esteem, narcissism, and depression has been noted in prior research, suggesting that “it is possible that the prospective effects of low self-esteem on depression . . . are even stronger when narcissism is statistically controlled for” (Sowislo & Orth, 2013, p. 231). More generally, many researchers from the field of self and identity have advised that for advancing self-esteem research it is critical to evaluate the effects of self-esteem by distinguishing genuine self-esteem from narcissism (Donnellan et al., 2011; Swann, Chang-Schneider, & Larsen McClarty, 2007; Tangney & Leary, 2003). Using a noteworthy analogy, Swann et al. (2007) wrote: “Indeed, we believe that conflating narcissism and true high self-esteem is profoundly problematic for the same reasons that it is problematic to mistake for a friend an enemy who is merely masquerading as a friend” (p. 87).

Therefore, in the present research we test whether the vulnerability effect of low self-esteem holds when examining genuine self-esteem (i.e., controlling for narcissism) or whether the vulnerability effect is confounded by narcissism. The evidence on mutual suppression effects between self-esteem and narcissism reviewed above shows that it is not self-evident that the effect of one of the constructs (e.g., self-esteem) holds when controlling for the other (e.g., narcissism). Stated differently, mutually controlling the constructs for each other may reveal surprising findings because the controlled (i.e., unique) effects of the constructs may deviate significantly from the uncontrolled effects. The results of the present research will support one of the following conclusions with regard to the vulnerability effect of low self-esteem on depression: (a) the effect becomes nonsignificant, or is significantly reduced, when narcissism is controlled for (because narcissism fully or partially accounts for the self-esteem effect), suggesting that the vulnerability effect observed in prior studies is confounded by narcissism; (b) the effect holds at approximately the same size when narcissism is controlled for, suggesting that the vulnerability effect is independent of narcissism; or (c) the effect becomes larger when narcissism is controlled for, suggesting that once the effect of self-esteem has been purified by removing the contaminating effect of narcissism, the vulnerability effect is even stronger than previous research suggests (i.e., narcissism suppresses the true self-esteem effect).

### Is There a Link Between Narcissism and Depression?

Besides providing evidence on the vulnerability model of low self-esteem, the present research will yield evidence on the prospective effect of narcissism on depression. As yet, there is a lack of longitudinal studies, so the extant empirical literature does not allow for conclusions about possible influences of narcissism on depression. Moreover, as we review below, the available theoretical perspectives lead to contradictory predictions with regard to whether narcissism reduces or increases the risk for depression.



One theoretical perspective is based on the literature on self-enhancement—a psychological construct that is strongly related to narcissism (John & Robins, 1994; Paulhus, 1998). Since Taylor and Brown's (1988) seminal article on illusion and well-being, many scholars believe that positively biased self-perception is adaptive for the individual's mental health, although the proposition is contested (for the debate, see Baumeister, 1989; Church et al., 2014; Colvin & Block, 1994; Colvin, Block, & Funder, 1995; Kwan, John, Robins, & Kuang, 2008; Robins & Beer, 2001; Taylor & Brown, 1994). Longitudinal studies have provided partial support for this perspective (Bonanno, Field, Kovacevic, & Kaltman, 2002; Bonanno, Rennieke, & Dekel, 2005; Dufner, Reitz, & Zander, 2014; but see Robins & Beer, 2001). Thus, narcissistic individuals might have a lower risk for depression because of habitual self-enhancement. The claim that narcissism is adaptive for the individual is further supported by the fact that cross-sectional studies typically show a negative correlation between narcissistic personality traits and depression (Aalsma, Lapsley, & Flannery, 2006; Sedikides et al., 2004; P. J. Watson & Biderman, 1993). Moreover, the conceptual overlap between narcissism and high self-esteem raises the possibility that high levels of narcissism—like high levels of self-esteem—decrease risk for depression. Indeed, researchers have explicitly hypothesized that narcissism is adaptive for the individual; for example, Campbell (2001) stated that narcissists experience “increased happiness and well-being” (p. 214) and that “narcissism may be a functional and healthy strategy for dealing with the modern world” (p. 215).

Several psychological mechanisms could account for an adaptive effect of narcissism. For example, narcissistic self-enhancement might lead to positive academic and work outcomes if it increases the person's ambition and motivation to tackle challenging tasks, which in turn could reduce risk for depression (Dufner et al., 2014; Pincus & Lukowitsky, 2010; Ronningstam, 2009). Furthermore, to maintain their positive self-image, narcissistic individuals tend to dampen feelings of self-doubt and shame by externalizing blame and focusing on the faults of others; although this regulatory strategy can lead to anger and aggression, it may effectively reduce negative self-focused affect and thereby reduce risk for depression (Baumeister, Smart, & Boden, 1996; Pincus, Cain, & Wright, 2014).

In contrast, a second theoretical perspective is based on a longstanding view in clinical psychology that narcissism is associated with depression (see Pincus & Lukowitsky, 2010; Ronningstam, 2009). For example, according to Horowitz (2009), narcissistic individuals are in the long run “more and more vulnerable to shame, panic, helplessness, or depression as life progresses without support from admiring others” (p. 126). Similarly, Pincus et al. (2014) report that “narcissistic patients can and often do present for psychotherapy in vulnerable states of depression, anxiety, shame, and even suicidality” (p. 439). In fact, research suggests that patients with narcissistic personality disorder (NPD) show higher depression compared with patients without NPD, although the effect size is small (Klein, 2003; Miller, Campbell, & Pilkonis, 2007). Thus, according to this perspective, the effects of self-esteem and narcissism on depression would point in opposite directions (i.e., decrease vs. increase in depression), despite the positive correlation between self-esteem and narcissism. This pattern of associations would correspond to the divergent effects of self-esteem and narcissism on antisocial behavior, as reviewed in

the previous section. Empirical support for a pattern of suppression effects is provided by cross-sectional data showing that the correlation between narcissism and depression, which is negative in its zero-order form (see above), becomes nonsignificant or even positive when self-esteem is controlled for (Sedikides et al., 2004; Tracy et al., 2009). Tracy et al. (2009) suggested that controlling for self-esteem “may reveal some of the maladjustment assumed to lurk beneath the well-defended narcissistic shell” (p. 207).

The perspective that narcissism is linked to high rather than low depression might be further supported by research on secular changes in personality and mental health. Twenge, Campbell, and colleagues (e.g., Twenge & Campbell, 2010; Twenge & Foster, 2010; Twenge, Konrath, Foster, Campbell, & Bushman, 2008) have argued that recent generations of youth are more narcissistic and experience more mental health problems than youth from earlier generations. According to Twenge and Campbell, the secular increase in narcissism justifies labeling contemporary youth “Generation Me,” and characterizing the situation as a “narcissism epidemic” (Twenge, 2006; Twenge & Campbell, 2009). Moreover, they argue that the secular increase in narcissism has contributed to higher rates of depression (Twenge, 2008; Twenge & Campbell, 2010). Although other researchers have reported evidence that contradicts the claimed increase in narcissism (Donnellan, Trzesniewski, & Robins, 2009; Trzesniewski & Donnellan, 2010; Trzesniewski, Donnellan, & Robins, 2008a, 2008b), the perspective put forward by Twenge and Campbell suggests that narcissism could be linked to depression.

Several mechanisms could account for the maladaptive effect of narcissism on depression. For example, the socially toxic attributes of narcissistic individuals such as self-centeredness, exploitativeness, and lack of empathy (Morf & Rhodewalt, 2001; Tracy et al., 2009) might increase the risk for interpersonal conflicts and experiences of rejection, which may contribute to the development of depression. Furthermore, given that narcissism is associated with impulsive and risk-taking behavior (Foster, Shenese, & Goff, 2009; Vazire & Funder, 2006), narcissistic individuals might experience more stressful life events such as accidents and serious illnesses, thereby increasing risk for depression (Kessler, 1997). Moreover, narcissistic individuals may oscillate between feelings of grandiosity versus feelings of vulnerability, self-doubt, and shame (Pincus & Lukowitsky, 2010; Ronningstam, 2009), and the resulting affective variability might contribute to depression (Thompson, Berenbaum, & Bredemeier, 2011; Thompson et al., 2012).

## The Present Research

The goal of this research was to refine the vulnerability model, by disentangling the prospective effects of low self-esteem and narcissism on depression. For the analyses, we used data from six longitudinal studies with samples of adolescents and adults. For each study, we tested the effects of self-esteem and narcissism (a) separately for each construct and (b) while mutually controlling the constructs for each other. After computing the study-level estimates, we meta-analytically aggregated the findings across studies. For reasons of completeness, we also examined and meta-analyzed the scar effect of depression on self-esteem and, likewise, the scar effect of depression on narcissism.

In addition, for exploratory purposes, we tested two hypotheses that might qualify the findings on the vulnerability effect of low self-esteem. First, although the findings reviewed above suggest that individuals with high self-esteem have a lower risk for developing depression than individuals with low self-esteem, it might be possible that having *very* high self-esteem is bad for the person's well-being, or, to put it differently, that there is a "dark side" of having high self-esteem with regard to mental health (cf. Baumeister et al., 1996). Thus, with increasing level of self-esteem, the effect of self-esteem on depression might become smaller and smaller and, at some point, even reverse its sign. Statistically speaking, the prospective effect of low self-esteem on depression might be curvilinear instead of linear. Second, even if narcissism has no main effect on depression, it is possible that a person's level of narcissism moderates the self-esteem effect. Thus, individuals with high self-esteem might have a lower risk for developing depression only if they do not simultaneously have high narcissism (put differently, high self-esteem might be less adaptive if combined with narcissism, even if overlapping variance between self-esteem and narcissism is already controlled for). We tested this hypothesis by examining whether self-esteem and narcissism interact in their prospective effect on depression.

To increase the validity of the analyses, we modeled self-esteem, narcissism, and depression as latent variables. The crucial advantage of using latent, instead of observed, variables is that measurement error, which may significantly bias the results, is controlled for (Cole & Preacher, 2014). Moreover, in the first step of the analyses, we tested for metric measurement invariance of the measures across waves (Schmitt & Kuljanin, 2008; Widaman, Ferrer, & Conger, 2010). Tests of prospective effects are valid only if metric measurement invariance holds, because it ensures that the latent constructs have the same meaning at each measurement occasion (Schmitt & Kuljanin, 2008).

## Method

The data come from six longitudinal studies, each of which included measures of self-esteem, narcissism, and depression. Table 1 provides an overview of descriptive information on the studies. Although the studies were heterogeneous with regard to many design and sample characteristics, the sample sizes were relatively similar, so that, consequently, none of the studies will

Table 1  
Descriptive Information on Studies

Study	N <sup>a</sup>	% female	Age group	Number of waves	Time lag between waves
BLS	496	57	Young adults	2	1 year
CFP	625	50	Adolescents	2	2 years
MPI	371	50	Adults	2	6 months
MWI	663	51	Adults	5	2 months
TDS	234	36	Young adults	2	6 weeks
YP	328	50	Young adults	4	6 months

Note. BLS = Berkeley Longitudinal Study; CFP = California Families Project; MPI = My Partner and I; MWI = My Work and I; TDS = Trainee Diary Study; YP = Your Personality.

<sup>a</sup> Sample size used to compute the study weights for the meta-analytic computations, reflecting the number of participants who provided data on at least one of the study variables at one of the assessments.

dominate the overall results when meta-analytically aggregating the findings across studies. In each of the studies, all three constructs were assessed at each wave, with the exception of the Berkeley Longitudinal Study (BLS), in which narcissism was assessed at Wave 1 only. Five of the six datasets were used in previous studies on the relation between self-esteem and depression; however, none of the previous studies examined narcissism.<sup>1</sup>

## Study 1: Berkeley Longitudinal Study (BLS)

The BLS is a study of a cohort of individuals who entered the University of California at Berkeley in 1992 (Robins, Hendin, & Trzesniewski, 2001). Six assessments were conducted over a 4-year period: first week of college, end of first semester, and end of first, second, third, and fourth year of college. Because depression was not assessed in the first two assessments and narcissism was assessed only in the first assessment, we used the assessments of self-esteem and depression at the end of first and second year as Wave 1 and Wave 2 measures, and narcissism from the first week of college as Wave 1 measure of narcissism.

**Participants.** The sample included 496 individuals (57% female). Mean age of participants at Wave 1 was 18.6 years ( $SD = 2.8$ , range = 17 to 77; one participant was 77 years old and five participants were between 21 and 30—all other participants were 20 years or younger). Data on study variables were available for 494 individuals at Wave 1 and 259 individuals at Wave 2.

### Measures.

**Self-esteem.** Self-esteem was assessed with the 10-item Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965), the most commonly used and well-validated measure of self-esteem (Donnellan, Trzesniewski, & Robins, 2015; Robins et al., 2001). Responses were measured on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with  $M = 3.87$  ( $SD = 0.79$ ) averaged across waves. Coefficient  $\alpha$  was .89 at Wave 1 and .90 at Wave 2.

**Narcissism.** Narcissism was assessed with the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979), using an abbreviated 33-item version. The NPI is the most frequently used and well-validated measure of narcissism (Ackerman et al., 2011; Corry, Merritt, Mrug, & Pamp, 2008; Emmons, 1987; Raskin & Terry, 1988). The NPI uses a forced-choice response format; that is, each item consists of two statements (one narcissistic and one nonnarcissistic statement) and participants are asked to choose the one that describes them better. For each item, the narcissistic statement was coded as 1 and the nonnarcissistic statement was coded as 0. Averaged across waves, the mean response was  $M = 0.42$  ( $SD = 0.17$ ). In particular when items are dichotomous (as is the case in the NPI), coefficient  $\alpha$  can underestimate the reliability of a scale (Raykov, Dimitrov, & Asparouhov, 2010). For scales with dichotomous items, we used coefficient  $\omega$  (McDonald, 1999),

<sup>1</sup> The datasets examined in the present research were used in the following previous studies on the relation between self-esteem and depression. Data from the Berkeley Longitudinal Study were used in Orth et al. (2008) and Orth, Robins, and Meier (2009). Data from the California Families Project were used in Robins et al. (2010) and Orth et al. (2014). Data from the study My Partner and I were used in Sowislo et al. (2014). Data from the study My Work and I were used in Kuster et al. (2012). Data from the Trainee Diary Study were used in Orth, Robins, and Meier (2009) and Sowislo et al. (2014).

following the recommendation by Widaman, Little, Preacher, and Sawalani (2011). Although  $\alpha$  is the most popular measure of reliability,  $\alpha$  (but not  $\omega$ ) is based on the assumption that all items of a scale are equally good measures of the construct, which frequently is an unrealistic assumption (Widaman et al., 2011). Coefficient  $\omega$  was .90.

**Depression.** Depression was assessed with the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a frequently used 20-item self-report measure for the assessment of depressive symptoms in nonclinical, subclinical, and clinical populations, and its validity has been repeatedly confirmed (Eaton, Smith, Ybarra, Muntaner, & Tien, 2004). Participants were instructed to assess the frequency of their reactions during the past week. Responses were measured on a 4-point scale (0 = rarely or none of the time, less than one day, 1 = some or a little of the time, one to two days, 2 = occasionally or a moderate amount of time, three to four days, and 3 = most or all of the time, five to seven days), with  $M = 0.96$  ( $SD = 0.59$ ) averaged across waves. The  $\alpha$  reliability of the CES-D was .91 at both Wave 1 and Wave 2.

### Study 2: California Families Project (CFP)

The CFP is an ongoing longitudinal study of 674 Mexican-origin youth (50% female) from Northern California, who have been assessed annually since 2006 when they were in 5th grade (Robins, Donnellan, Widaman, & Conger, 2010). Measures of self-esteem, narcissism, and depression were administered in Years 5 and 7 (denoted as Waves 1 and 2 in the remainder of this article).

**Participants.** Mean age of participants at Wave 1 was 14.3 years ( $SD = 0.5$ ). Data on study variables were available for 604 participants at Wave 1 and 600 participants at Wave 2.

#### Measures.

**Self-esteem.** Self-esteem was assessed with the 10-item RSE. Responses were measured on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*), with  $M = 3.12$  ( $SD = 0.42$ ) averaged across waves. Coefficient  $\alpha$  was .85 at both Wave 1 and Wave 2.<sup>2</sup>

**Narcissism.** Narcissism was assessed with the 12-item Narcissistic Personality Questionnaire for Children-Revised (NPQC-R; Ang & Raine, 2009). Responses were measured on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with  $M = 2.88$  ( $SD = 0.59$ ) averaged across waves. Coefficient  $\alpha$  was .78 at Wave 1 and .83 at Wave 2.

**Depression.** Depression was assessed with the Mini Mood and Anxiety Symptom Questionnaire (Mini-MASQ; Casillas & Clark, 2000). The scale included all 13 items from the depression subscales of the MASQ (i.e., General Distress: Depressive Symptoms, Loss of Interest, and High Positive Affect [reverse-scored]; D. Watson et al., 1995). Participants were instructed to assess the frequency of their reactions during the past week. Responses were measured on a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*), with  $M = 2.03$  ( $SD = 0.48$ ) averaged across waves. Coefficient  $\alpha$  was .85 at Wave 1 and .88 at Wave 2.

### Study 3: My Partner and I (MPI)

The MPI is a German-language study of couples living in Switzerland (Orth, 2013). The design included two waves with

assessments of trait measures, separated by 6 months. Participants were assessed in 2011.

**Participants.** The sample included 186 couples (i.e., 372 individuals, 50% female). At Wave 1, mean age of participants was 29.1 years ( $SD = 8.8$ , range = 18 to 61). Data on study variables were available for 371 individuals at Wave 1 and 341 individuals at Wave 2.

#### Measures.

**Self-esteem.** Self-esteem was assessed with the 10-item RSE (for the German version, see von Collani & Herzberg, 2003), using a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with  $M = 4.12$  ( $SD = 0.75$ ) averaged across waves. Coefficient  $\alpha$  was .91 at both Wave 1 and Wave 2.

**Narcissism.** Narcissism was assessed with the NPI (for the German version, see Schütz, Marcus, & Selin, 2004), using the 16-item short form suggested by Ames, Rose, and Anderson (2006). For each item, the narcissistic statement was coded as 1 and the nonnarcissistic statement was coded as 0. Averaged across waves, the mean response was  $M = 0.34$  ( $SD = 0.18$ ). Coefficient  $\omega$  was .79 at Wave 1 and .77 at Wave 2.

**Depression.** Depression was assessed with the 20-item CES-D (for the German version, see Hautzinger & Bailer, 1993). For each item, participants reported how frequently they experienced the symptom during the past week using a 4-point scale (0 = rarely or none of the time, less than one day; 1 = some or a little of the time, one to two days; 2 = occasionally or a moderate amount of time, three to four days; and 3 = most or all of the time, five to seven days), with  $M = 0.58$  ( $SD = 0.43$ ) averaged across waves. Coefficient  $\alpha$  was .89 at both Wave 1 and Wave 2.

### Study 4: My Work and I (MWI)

The MWI is a German-language study of work experiences and well-being. The participants were assessed five times at 2-month intervals (Meier & Spector, 2013); the assessments were conducted in 2009 and 2010.

**Participants.** The sample included 663 individuals (51% female). At Wave 1, mean age of participants was 32.4 years ( $SD = 10.5$ , range = 16 to 62). Data on study variables were available for 663 individuals at Wave 1, 527 individuals at Wave 2, 462 individuals at Wave 3, 399 individuals at Wave 4, and 377 individuals at Wave 5.

#### Measures.

**Self-esteem.** Self-esteem was assessed with the 10-item RSE. Responses were measured on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with  $M = 4.21$  ( $SD = 0.63$ ) averaged across waves. The  $\alpha$  reliability of the RSE was .88 at Wave 1, .89 at Wave 2, .90 at Wave 3, .90 at Wave 4, and .90 at Wave 5.

**Narcissism.** Narcissism was assessed with the 16-item short form of the NPI (Ames et al., 2006). The MWI used a modified

<sup>2</sup> The CFP dataset includes an additional measure of self-esteem, specifically the 6-item General Self subscale of the Self-Description Questionnaire II (Marsh, Ellis, Parada, Richards, & Heubeck, 2005). Responses were measured on a 4-point scale ranging from 1 (*not at all true*) to 4 (*very true*), with  $M = 3.16$  ( $SD = 0.47$ ) averaged across waves. Coefficient  $\alpha$  was .80 at Wave 1 and .78 at Wave 2. When we used this measure instead of the RSE, the study-level results were relatively similar and the meta-analytic pattern of findings was unaltered.



version of the NPI: participants were asked how much they agree with the narcissistic statements included in the original items (thus, the nonnarcissistic statements were not presented). Responses were measured on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with  $M = 3.80$  ( $SD = 1.02$ ) averaged across waves. The  $\alpha$  reliability was .89 at Wave 1, .89 at Wave 2, .90 at Wave 3, .91 at Wave 4, and .92 at Wave 5.

**Depression.** Depression was assessed with the 20-item CES-D. Participants were instructed to assess how frequently they had experienced each symptom within the preceding 30 days. Responses were measured on a 4-point scale (0 = *rarely or none of the time*, 1 = *some or a little of the time*, 2 = *occasionally or a moderate amount of time*, and 3 = *most or all of the time*), with  $M = 0.54$  ( $SD = 0.41$ ) averaged across waves. The  $\alpha$  reliability of the CES-D was .89 at all five waves.

### Study 5: Trainee Diary Study (TDS)

The TDS is a German-language study with a sample of trainees from a large Swiss company (Orth, Robins, & Meier, 2009), who were assessed twice with a 6-week interval between assessments. Participants were assessed in 2006.

**Participants.** The sample included 253 individuals (36% female). Mean age of participants at Wave 1 was 18.0 years ( $SD = 1.3$ , range = 16 to 23). Data on study variables were available for 221 individuals at Wave 1 and 185 individuals at Wave 2.

#### Measures.

**Self-esteem.** Self-esteem was assessed with the 10-item RSE. Responses were measured on a 6-point scale ranging from 0 (*strongly disagree*) to 5 (*strongly agree*), with  $M = 3.76$  ( $SD = 0.88$ ) averaged across waves. The  $\alpha$  reliability was .86 at Wave 1 and .89 at Wave 2.

**Narcissism.** Narcissism was assessed with the German 15-item short form of the NPI (Schütz et al., 2004). The TDS used a modified version of the NPI: participants were asked how much they agree with the narcissistic statements included in the original items (thus, the nonnarcissistic statements were not presented). Responses were measured on a 6-point scale ranging from 0 (*strongly disagree*) to 5 (*strongly agree*), with  $M = 2.34$  ( $SD = 1.01$ ) averaged across waves. The  $\alpha$  reliability was .92 at Wave 1 and .93 at Wave 2.

**Depression.** Depression was assessed with the German 15-item short form of the CES-D (Hautzinger & Bailer, 1993). Participants were instructed to assess the frequency of their reactions within the preceding 7 days. Responses were measured on a 4-point scale (0 = *rarely or none of the time*, 1 = *sometimes*, 2 = *frequently*, and 3 = *most of the time*), with  $M = 0.70$  ( $SD = 0.57$ ) averaged across waves. The  $\alpha$  reliability was .92 at both Wave 1 and Wave 2.

### Study 6: Your Personality (YP)

The YP is a German-language study of young adults living in Switzerland, who were assessed four times at 6-month intervals (Orth & Luciano, 2015). Participants were assessed in 2010 and 2011.

**Participants.** The sample included 344 individuals (49% female). At Wave 1, mean age of participants was 21.1 years ( $SD = 2.0$ , range = 18 to 25). Data on study variables were available for

328 individuals at Wave 1, 224 individuals at Wave 2, 203 individuals at Wave 3, and 215 individuals at Wave 4.

#### Measures.

**Self-esteem.** Self-esteem was assessed with the 10-item RSE. Responses were measured on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), with  $M = 3.87$  ( $SD = 0.81$ ) averaged across waves. Coefficient  $\alpha$  was .91 at Wave 1, .90 at Wave 2, .92 at Wave 3, and .92 at Wave 4.

**Narcissism.** Narcissism was assessed with the 16-item short form of the NPI (Ames et al., 2006). For each item, the narcissistic statement was coded as 1 and the nonnarcissistic statement was coded as 0. Averaged across waves, the mean response was  $M = 0.36$  ( $SD = 0.19$ ). Coefficient  $\omega$  was .78 at Wave 1, .81 at Wave 2, .80 at Wave 3, and .82 at Wave 4.

**Depression.** Depression was assessed with the 20-item CES-D. For each item, participants reported how frequently they experienced the symptom during the past week using a 4-point scale (0 = *rarely or none of the time, less than one day*; 1 = *some or a little of the time, one to two days*; 2 = *occasionally or a moderate amount of time, three to four days*; and 3 = *most or all of the time, five to seven days*), with  $M = 0.76$  ( $SD = 0.49$ ) averaged across waves. Coefficient  $\alpha$  was .91 at Wave 1, .92 at Wave 2, .91 at Wave 3, and .89 at Wave 4.

### Statistical Analyses

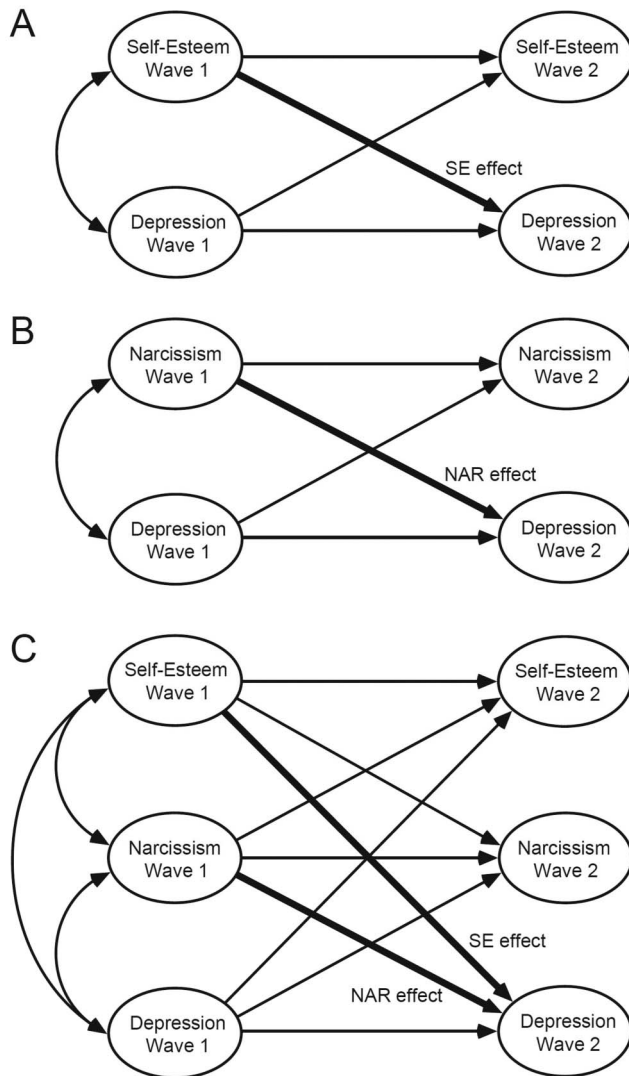
The analyses of structural equation models were conducted using the Mplus 7.2 program (Muthén & Muthén, 2012). To deal with missing values, we used full information maximum likelihood estimation to fit models directly to the raw data, which produces less biased and more reliable results compared with conventional methods of dealing with missing data, such as listwise or pairwise deletion (Schafer & Graham, 2002; Widaman, 2006). Fit was assessed by the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root-mean-square error of approximation (RMSEA), based on the recommendations of Hu and Bentler (1999) and MacCallum and Austin (2000). Hu and Bentler (1999) suggest that good fit is indicated by values greater than or equal to .95 for CFI and TLI, and less than or equal to .06 for RMSEA. To test for differences in model fit, we used the test of small difference in fit (MacCallum, Browne, & Cai, 2006, Program C). For these tests, statistical power was high, with values above .99 (MacCallum et al., 2006, Program D). Models including interactions between latent variables were estimated by numerical integration using the default algorithm, that is, rectangular integration (Muthén & Muthén, 2012). Quadratic effects of latent variables were tested by including the squared latent variable in the model (using the XWITH command in Mplus) and by testing the effect of the squared latent variable, over and above the effect of the nonsquared latent variable.

For the meta-analytic computations, we used SPSS 20 and the SPSS macros written by Daniel B. Wilson (Lipsey & Wilson, 2001, Appendix D). All computations with effect sizes were made using Fisher's  $Z_r$  transformations. For computing the weighted mean effect sizes, we used random-effects models and study weights with  $w = n - 3$  (Lipsey & Wilson, 2001; Raudenbush, 2009).

## Results

### Study-Level Analyses

We used cross-lagged latent variable regression models for the analysis of prospective effects between self-esteem, narcissism, and depression (Finkel, 1995; Little, Preacher, Selig, & Card, 2007). Figure 1 provides generic illustrations of the models used.



**Figure 1.** The figure illustrates the structural models used in the present research, for self-esteem and depression (A), narcissism and depression (B), and self-esteem, narcissism, and depression (C). The relations between factors are specified as cross-lagged effects, which indicate the prospective effect of one variable on the other, after controlling for their stabilities across time and—in Panel C—for the prospective effect of a third construct. Thus, whereas in Panel A the self-esteem effect is uncontrolled for narcissism and in Panel B the narcissism effect is uncontrolled for self-esteem, in Panel C the self-esteem and narcissism effects are mutually controlled for each other. The figure shows only latent constructs and omits observed variables and intercorrelations of residual variances at Wave 2. SE = self-esteem; NAR = narcissism.

In each study, we tested a bivariate model of self-esteem and depression to compute the uncontrolled effect of self-esteem on depression (Figure 1A), a bivariate model of narcissism and depression to compute the uncontrolled effect of narcissism on depression (Figure 1B), and a trivariate model of self-esteem, narcissism, and depression to compute effects of self-esteem and narcissism on depression that were mutually controlled for each other (Figure 1C). In the models, the cross-lagged paths indicate the prospective effects of the variables on each other (e.g., effect of self-esteem at Wave 1 on depression at Wave 2), after controlling for their stabilities across time (e.g., effect of depression at Wave 1 on depression at Wave 2). We accounted for variance attributable to specific measurement occasions by correlating the residual variances within waves (e.g., the residual of self-esteem at Wave 2 and the residual of depression at Wave 2; cf. Cole & Maxwell, 2003). To measure the latent factors, we used item parcels as indicators because parcels produce more reliable latent variables than individual items (Little, Cunningham, Shahar, & Widaman, 2002; but see Marsh, Lüdtke, Nagengast, Morin, & Von Davier, 2013). For each latent factor, we aggregated the items into three parcels. Parcels were created in identical ways across waves, using the balancing technique recommended by Little, Rhemtulla, Gibson, and Schoemann (2013). The error variances of each parcel were allowed to correlate across waves to control for bias caused by parcel-specific variance (Cole & Maxwell, 2003).

We first tested for metric measurement invariance of the measures (Schmitt & Kuljanin, 2008; Widaman et al., 2010). The results of cross-lagged regression models are valid only if metric measurement invariance holds (Schmitt & Kuljanin, 2008), which can be tested by comparing the fit of a measurement model in which the factor loadings are constrained to be equal across waves with the fit of a measurement model in which the factor loadings are freely estimated. In all studies, constraining the loadings to be equal across waves did not significantly worsen model fit, as indicated by the test of small difference in fit (see Table 2), suggesting that metric measurement invariance held. Consequently, we used these constraints in the remainder of the analyses.

Next, for each study we tested the three structural models shown in Figure 1. For studies that covered more than one time interval (i.e., studies with more than two waves), the stability and cross-lagged coefficients were constrained to be equal across time intervals; as indicated by the test of small difference in fit, these constraints did not significantly worsen model fit. The fit of the models was good (see Table 3). Table 4 shows the key findings for the six studies.<sup>3</sup> Moreover, Table 4 shows for each study the correlation between self-esteem and narcissism, based on the results for the trivariate model. Overall, the results were as expected. Self-esteem and narcissism showed a significant positive correlation in each of the studies, ranging from medium to large effect size. All self-esteem effects on depression had a negative sign and

<sup>3</sup> For studies that included more than two waves, the models yielded more than one estimate for the prospective effects (i.e., one estimate for each time interval between waves). Although the coefficients were constrained to be equal across time intervals, the constraints were imposed on unstandardized coefficients (as typically recommended), which led to slight variation in the resulting standardized coefficients. Therefore, the standardized coefficients were averaged across time intervals using Fisher's  $Z_r$  transformations.



were significant. Compared with the self-esteem effects, the effects of narcissism on depression were smaller and mostly non-significant; when controlling for self-esteem, four of the six narcissism effects had a positive sign.

**Meta-Analytic Aggregation of the Findings**

We next meta-analytically aggregated the findings across studies. We computed weighted mean effect sizes for the cross-sectional correlation between self-esteem and narcissism, for the uncontrolled and controlled effects of self-esteem and narcissism on depression, and, for both self-esteem and narcissism, for the differences between the uncontrolled and controlled effects on depression. Table 5 shows the results. First, the mean correlation between self-esteem and narcissism (.40) was of medium to large size, consistent with prior studies (Ackerman et al., 2011; Brown & Zeigler-Hill, 2004; Paulhus et al., 2004). Second, the uncontrolled (-.26) and controlled (-.27) effects of self-esteem on depression were virtually identical, and did not differ significantly from each other. Thus, the results suggest that the vulnerability effect of low self-esteem on depression is not confounded by narcissism. Third, the uncontrolled effect (-.06) of narcissism on depression was negative and significant, whereas the controlled effect (.01) was positive but nonsignificant; the difference between the two effects was significant. Thus, controlling for self-esteem significantly altered the effect of narcissism on depression, making it virtually zero.

The homogeneity statistics were significant for some of the effect sizes (see Table 5), indicating that the variance of the corresponding effect sizes must be attributed not only to within-study sampling error but also to between-study sampling error. The small number of studies was not sufficient to examine moderators that might account for between-study variability in the effect sizes (for meta-analytic tests of moderators of the effect of self-esteem

Table 3  
*Fit of Models Tested*

Study and model	$\chi^2$	df	CFI	TLI	RMSEA [90% CI]
<b>BLS</b>					
SE and D	70.0*	46	.99	.99	.039 [.018, .056]
NAR and D	22.7	23	1.00	1.00	.000 [.000, .036]
SE, NAR, and D	116.1*	78	.99	.99	.031 [.018, .043]
<b>CFP</b>					
SE and D	83.1*	46	.99	.99	.036 [.023, .048]
NAR and D	135.8*	46	.98	.97	.056 [.045, .067]
SE, NAR, and D	254.0*	117	.98	.97	.043 [.036, .051]
<b>MPI</b>					
SE and D	60.0	46	1.00	.99	.029 [.000, .047]
NAR and D	75.8*	47	.99	.98	.041 [.023, .057]
SE, NAR, and D	155.3*	117	.99	.99	.030 [.015, .041]
<b>MWI</b>					
SE and D	656.3*	352	.98	.97	.036 [.032, .040]
NAR and D	609.0*	352	.98	.98	.033 [.029, .038]
SE, NAR, and D	1444.8*	855	.98	.97	.032 [.029, .035]
<b>TDS</b>					
SE and D	61.1	46	.99	.99	.037 [.000, .061]
NAR and D	78.1*	46	.99	.98	.055 [.033, .075]
SE, NAR, and D	193.8*	117	.98	.97	.053 [.039, .066]
<b>YP</b>					
SE and D	321.9*	220	.98	.98	.038 [.028, .046]
NAR and D	336.9*	220	.97	.96	.040 [.031, .049]
SE, NAR, and D	711.5*	537	.98	.97	.031 [.025, .038]

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root-mean-square error of approximation; CI = confidence interval; SE = self-esteem; D = depression; NAR = narcissism; BLS = Berkeley Longitudinal Study; CFP = California Families Project; MPI = My Partner and I; MWI = My Work and I; TDS = Trainee Diary Study; YP = Your Personality.

\*  $p < .05$ .

on depression, see Sowislo & Orth, 2013). However, it should be noted that the homogeneity statistics for the differences between uncontrolled and controlled effects were nonsignificant. Consequently, between-study variability must not be considered when drawing conclusions about how mutually controlling the constructs for each other alters the effects of self-esteem and narcissism on depression.

For reasons of completeness, we also examined the scar effect of depression on self-esteem and, likewise, the scar effect of depression on narcissism (see Supplemental Tables S1 and S2 for details). Consistent with prior studies, the scar effect of depression on self-esteem was small and nonsignificant, regardless of whether narcissism was controlled for or not (-.04). Similarly, the scar effect of depression on narcissism was close to zero. The uncontrolled effect was -.02 and the controlled effect (i.e., controlling for self-esteem) was .02; the difference between the coefficients was nonsignificant.

**Testing Two Qualifications of the Prospective Effect of Self-Esteem on Depression**

Finally, we tested two hypotheses that might qualify the vulnerability effect of low self-esteem on depression. First, although the analyses reported above suggest that individuals with high self-esteem have a lower risk for depression, it is possible that having very high self-esteem is maladaptive, and increases risk for depression. If so, we would expect the prospective effect of low

Table 2  
*Tests of Metric Measurement Invariance*

Study	$df_A$	$df_B$	Critical $\Delta\chi^2$	Observed $\Delta\chi^2$
BLS	78	74	76.1	2.1
CFP	117	111	128.9	27.7
MPI	117	111	85.4	20.9
MWI	774	750	710.6	26.1
TDS	117	111	60.9	8.6
YP	492	474	257.9	15.6

Note. For each study, metric measurement invariance of self-esteem, narcissism, and depression was tested in one model, to avoid inflation of the Type 1 error rate by conducting multiple tests. Metric measurement invariance was tested by comparing the fit of a measurement model in which the factor loadings were constrained to be equal across time (Model A) and a measurement model without such constraints (Model B), using the test of small difference in fit (MacCallum et al., 2006). For all tests, number of groups  $G = 1$ . For the sample size of the studies, see Table 1. Given that the observed  $\Delta\chi^2$  values were smaller than the critical  $\Delta\chi^2$  values, the results indicated that metric measurement invariance constraints did not significantly decrease fit.  $df_A$  = degrees of freedom of the model with metric measurement invariance constraints;  $df_B$  = degrees of freedom of the model without metric measurement invariance constraints; BLS = Berkeley Longitudinal Study; CFP = California Families Project; MPI = My Partner and I; MWI = My Work and I; TDS = Trainee Diary Study; YP = Your Personality.

Table 4  
*Prospective Effects of Self-Esteem and Narcissism on Depression (Vulnerability Effects)*

Study	$r_{SE,NAR}$	SE→D		NAR→D	
		Uncontrolled	Controlled	Uncontrolled	Controlled
BLS	.36*	-.23*	-.24*	-.04	.03
CFP	.47*	-.23*	-.19*	-.16*	-.10*
MPI	.34*	-.26*	-.25*	-.10	-.03
MWI	.45*	-.16*	-.19*	-.00	.06*
TDS	.25*	-.43*	-.47*	-.01	.10
YP	.48*	-.27*	-.29*	-.06	.04

Note.  $r_{SE,NAR}$  is the correlation between the latent constructs at Wave 1. SE = self-esteem; D = depression; NAR = narcissism; BLS = Berkeley Longitudinal Study; CFP = California Families Project; MPI = My Partner and I; MWI = My Work and I; TDS = Trainee Diary Study; YP = Your Personality.

\*  $p < .05$ .

self-esteem on depression to be curvilinear (instead of linear, as tested in the analyses reported above). We examined this hypothesis by testing whether self-esteem has a quadratic cross-lagged effect (i.e., an effect that would capture the curvilinear trend of the effect), over and above its linear cross-lagged effect.<sup>4</sup>

We tested the quadratic effects of self-esteem both with and without controlling for narcissism. In studies that included more than two waves, we estimated the quadratic effect for each time interval in separate models, because testing for quadratic effects of latent variables significantly increases the computational demands. Thus, for each set of models (i.e., with and without narcissism), we conducted 11 tests of quadratic effects (i.e., one test each in four studies with two waves, four tests in the MWI, and three tests in the YP). The pattern of results was nearly identical across the two sets of models, with only one significant effect emerging in each set of models. The aggregated quadratic effect was not significant, regardless of whether narcissism was ( $Z = 1.52$ , *ns*) or was not ( $Z = 1.50$ , *ns*) included. These results indicate that the self-esteem effect on depression is essentially linear across the continuum from low to high self-esteem (regardless of whether or not narcissism is controlled for). Thus, the findings do not support the hypothesis that having very high self-esteem is detrimental to a person's well-being.<sup>5</sup>

Second, it is possible that individuals with high self-esteem have a lower risk for developing depression only if they do not simultaneously have high narcissism. That is, narcissism might moderate the self-esteem effect. This hypothesis can be tested by examining whether self-esteem and narcissism interact in their prospective effect on depression. Again, we conducted 11 tests of interaction effects and found only one significant effect. The aggregated interaction effect was nonsignificant ( $Z = 0.05$ , *ns*), suggesting that the vulnerability effect of low self-esteem on depression replicated across different levels of narcissism.

## Discussion

The goal of the present research was to refine the vulnerability model of low self-esteem and depression, by testing whether the self-esteem effect is truly due to a lack of genuine self-esteem or due to a lack of narcissistic self-enhancement. For the analyses, we

used data from six longitudinal studies with a combined sample size of 2,717 participants. In each study, we tested the prospective effects of self-esteem and narcissism on depression both separately for each construct and mutually controlling the constructs for each other (i.e., a strategy that informs about effects of genuine self-esteem and pure narcissism), and then meta-analytically aggregated the findings. The results indicated that the effect of low self-esteem holds when narcissism is controlled for (uncontrolled effect =  $-.26$ , controlled effect =  $-.27$ ). In contrast, the effect of narcissism was close to zero when self-esteem was controlled for (uncontrolled effect =  $-.06$ , controlled effect =  $.01$ ). Moreover, the analyses suggested that the self-esteem effect is linear across the continuum from low to high self-esteem (i.e., the effect was not weaker at very high levels of self-esteem). Finally, self-esteem and narcissism did not interact in their effect on depression; that is, individuals with high self-esteem have a lower risk for developing depression, regardless of whether or not they are narcissistic.

## Implications of the Findings

The findings of the present research refine the vulnerability model by ruling out the competing hypothesis that the vulnerability effect is not due to a lack of genuine self-esteem but due to a lack of narcissistic self-enhancement. Although people's self-esteem may, in fact, be partially based on an overly positive view on the self (Kwan, John, Kenny, Bond, & Robins, 2004; Kwan et al., 2009; Paulhus, 1998), the important conclusion from the present research is that a lack of narcissistic self-enhancement is not responsible for the vulnerability effect of low self-esteem. On the contrary, the present research supports the conclusion that individual differences in the genuine component of self-esteem account for the prospective effect of self-esteem. This conclusion is based on the assumption that when self-esteem and narcissism are mutually controlled for each other their unique effects inform about effects of genuine self-esteem (i.e., self-esteem that is authentic, secure, and free from arrogance) and pure narcissism (i.e., narcissism that is free from healthy self-esteem), respectively—an assumption that is well-supported on both conceptual and empirical grounds. As discussed in the Introduction, conceptually, self-esteem is characterized by feelings of self-acceptance and self-respect, whereas narcissism includes grandiosity, self-centeredness, and feelings of superiority. Empirically, self-esteem correlates with authenticity, authentic pride, and low attachment anxiety (Tracy et al., 2009) and with benevolence and merit (Kwan et al., 2009). In contrast, narcissism correlates with hubristic pride (Tracy et al., 2009), overclaiming bias (Paulhus, Harms, Bruce, & Lysy, 2003; Tracy et al., 2009), and self-esteem contingencies in

<sup>4</sup> The validity of the test would be reduced if many participants max out (i.e., have the highest score possible) on the RSE, the measure of self-esteem used in the studies. However, although responses to the RSE were left-skewed in all studies (as indicated by a sample mean above the center of the response scale), the percentage of participants who maxed out was very low. Across studies, the average proportion of participants with maximum scores ranged from 4% to 8%.

<sup>5</sup> For reasons of completeness, we also tested for quadratic effects of narcissism. The aggregated quadratic effect was not significant, regardless of whether self-esteem was ( $Z = -1.66$ , *ns*) or was not ( $Z = -0.72$ , *ns*) included.

Table 5  
*Meta-Analysis of Prospective Effects of Self-Esteem and Narcissism on Depression (Vulnerability Effects)*

Effect	Weighted mean effect size <sup>a</sup>	95% CI	Homogeneity ( <i>Q</i> )
$r_{SE,NAR}$	.40*	[.33, .46]	19.2*
SE→D			
Uncontrolled	-.26*	[-.32, -.19]	15.9*
Controlled	-.27*	[-.34, -.19]	20.7*
Difference controlled–uncontrolled	-.01	[-.04, .03]	2.5
NAR→D			
Uncontrolled	-.06*	[-.12, -.01]	10.0
Controlled	.01	[-.05, .07]	12.2*
Difference controlled–uncontrolled	.07*	[.03, .11]	0.8

*Note.* Computations were made with a random-effects model. For all meta-analytic computations, the number of studies was  $k = 6$  and the total number of participants was  $N = 2,717$ .  $r_{SE,NAR}$  is the correlation between the latent constructs at Wave 1. CI = confidence interval; SE = self-esteem; D = depression; NAR = narcissism.

<sup>a</sup> Standardized regression coefficient.

\*  $p < .05$ .

the domains of appearance and competition (Crocker, Luhtanen, Cooper, & Bouvrette, 2003).

The vulnerability model of low self-esteem and depression is further strengthened by the fact that the analyses failed to support two hypotheses that might have qualified the vulnerability effect. First, we tested the hypothesis that having very high self-esteem is detrimental to a person's well-being. More specifically, although individuals with high self-esteem have a lower risk for developing depression, this effect might not be present or even reversed for individuals with *very* high self-esteem. However, this hypothesis was not supported, given that across the six studies the self-esteem effect on depression was linear across the continuum from low to high self-esteem. Thus, the results do not suggest that high self-esteem has a "dark side," at least not with respect to reports of depression. Second, the results did not support the hypothesis that individuals with high self-esteem have a lower risk for developing depression only if they do not simultaneously have high narcissism. Across the six studies, the vulnerability effect of self-esteem was not moderated by narcissism.

In the present research, the size of the vulnerability effect of low self-esteem on depression was larger than the effect size estimated in a recent meta-analysis on the topic (Sowislo & Orth, 2013); specifically, in the present research the vulnerability effect was  $-.26$  (not controlled for narcissism), whereas in the meta-analysis by Sowislo and Orth (2013) the effect was  $-.16$ . This difference might reflect the fact that in the present research we modeled the constructs as latent variables whereas most studies included in Sowislo and Orth (2013) examined observed variables; latent variable models often yield larger effect sizes because the effects are not attenuated by measurement error. Another possible source of the difference is that the present studies used established measures of the constructs, whereas in Sowislo and Orth (2013) some of the effect sizes were based on measures with less than optimal reliability and validity, which might have attenuated the average effect size. However, regardless of the true size of the vulnerability effect, the most important point in the present context is that controlling for narcissism did not reduce the magnitude of the effect.

The vulnerability effect of low self-esteem replicated across different time lags, ranging from 6 weeks to 2 years. This finding

may be surprising because statistical theory suggests that the prospective effect of one variable on another should vary as a function of the time lag between assessments; this is because a minimum amount of time is needed for an effect to unfold and because an effect should fade away when the time lag becomes very long (Cole & Maxwell, 2003). However, with regard to the vulnerability effect, meta-analytic evidence suggests that the effect holds across a wide range of time lags from a few days to many years (Sowislo & Orth, 2013; see also the findings of a 23-year longitudinal study by Steiger et al., 2014). Thus, consistent with previous research, the present findings indicate that the effect of low self-esteem can be detected regardless of whether it is tested across several weeks, months, or a few years.

The present research suggests that narcissism is neither a protective nor a risk factor for depression. Although the uncontrolled prospective effect of narcissism was significant (pointing in the direction of a protective factor), when self-esteem was controlled the narcissism effect became essentially zero. Thus, the findings suggest that the small protective effect of narcissism is resulting from the self-esteem component included in measures of narcissism. Although the effect of controlling for self-esteem was not large, the difference between the uncontrolled and controlled prospective effects of narcissism was significant. We believe that the null effect of narcissism on depression (when controlling for self-esteem) is an important finding (for a discussion of when and why null effects advance the field, see Fraley & Marks, 2007; Greenwald, 1975). First, the confidence interval of the effect supports the conclusion that the effect is at most small and likely close to zero. Second, the null effect is theoretically relevant because the question of whether narcissism and self-enhancement is adaptive or maladaptive for the individual's well-being has attracted considerable attention among researchers (Church et al., 2014; Colvin & Block, 1994; Robins & Beer, 2001; Taylor & Brown, 1988), although with regard to narcissism, well-designed longitudinal studies had not been available. However, a caveat that should be noted is that in the present research narcissism was assessed using measures of normal individual differences in narcissism (rather than clinical measures of narcissistic person-



ality disorder), which limits the conclusions with regard to the relation between clinically relevant narcissism and depression.

Across the studies included in the present research, the mean correlation between self-esteem and narcissism was medium to large in magnitude, consistent with prior research (Ackerman et al., 2011; Brown & Zeigler-Hill, 2004; Paulhus et al., 2004). However, it should be noted that self-esteem is less strongly, or even negatively, correlated with specific narcissistic characteristics such as sense of entitlement and exploitativeness (Ackerman & Donnellan, 2013; Rosenthal, Montoya, Ridings, Rieck, & Hooley, 2011; Trzesniewski et al., 2008b). These findings suggest that self-esteem is more strongly related to adaptive rather than maladaptive characteristics of narcissism, supporting the conclusion—as discussed in the Introduction—that self-esteem can, and should be, distinguished from narcissism (see also Donnellan et al., 2011, 2015).

The contribution of the present research is strengthened by procedures that enhance the robustness of the findings. First, we used data from six independent studies with an overall sample size of 2,717 individuals, providing strong statistical power for the analyses. Second, the six studies were heterogeneous with regard to many sample and design characteristics (such as age of participants, recruitment strategy, and time lag between assessments), strengthening the generalizability of the findings. Third, as mentioned above, the studies included established multi-item measures of the constructs, strengthening the validity of the findings. Fourth, the constructs were examined as latent variables, increasing the validity of the estimates by controlling for the confounding influence of measurement error. Fifth, two studies included more than two repeated assessments (specifically, four and five assessments), which increased the validity of the estimates by aggregating the information across waves. Sixth, the meta-analytic procedure provided for estimates based on the evidence from all six studies; moreover, given that we used random-effects models, the weighted mean effect sizes and confidence intervals account for the possible influence of between-study differences. In summary, the present research contributes robust information to the body of cumulative knowledge about the vulnerability model of low self-esteem and depression.

The fact that the self-esteem effect on depression was virtually unaltered by controlling for narcissism supports the validity of previous research on the vulnerability model, in which narcissism was not controlled for. In other words, the present research suggests that research on the vulnerability model does not necessarily need to control for narcissism to yield trustworthy results. Moreover, given that narcissism did not moderate the self-esteem effect, the present research suggests that when considering for whom and when low self-esteem is a vulnerability factor, it is not necessary to have information on the person's level of narcissism. For example, research on self-esteem development—a field of research that generally did not control for narcissism—suggests that adolescence and old age are life stages in which people typically experience lower self-esteem than in other life stages such as young and middle adulthood (Orth & Robins, 2014). Thus, the present findings strengthen the conclusion that adolescence and old age are developmental periods in which individuals are typically more vulnerable to depression because of low self-esteem.

## Limitations and Future Directions

A limitation of the present research is that the nonexperimental, naturalistic study designs do not allow for strong conclusions regarding the causality of the prospective effect of low self-esteem on depression (Finkel, 1995); of course, in the present context, experimental designs are not feasible for ethical and practical reasons. It is important to note that previous research has sought to test whether low self-esteem is merely a precursor of depression without any causal influence (i.e., because both self-esteem and depression are influenced by the same underlying factors). For example, it is possible that stressful life events cause both low self-esteem and depression, and, consequently, low self-esteem might merely be an early manifestation of depression. However, the available evidence does not support the precursor model. As mentioned at the beginning of this article, research suggests that the vulnerability effect of low self-esteem holds when the effects of theoretically relevant third variables such as stressful life experiences, daily hassles, low social support, relational victimization, and neuroticism are controlled for (Orth et al., 2014; Orth, Robins, & Meier, 2009; Sowislo et al., 2014). The present research contributes to these studies by showing that the vulnerability effect of low self-esteem is not resulting from a confounding effect of narcissism.

Although the studies examined in the present research were conducted in two different countries (i.e., United States and Switzerland) and although one study included Mexican-origin adolescents, it is unclear whether the results generalize to samples from other cultural contexts such as African and Asian countries (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010). Examining the cross-cultural validity of the present findings is particularly important, because there is an ongoing debate about whether members of collectivistic cultures show the same need for self-esteem and the same level of narcissism and self-enhancement bias as do members of individualistic cultures (Cai, Wu, & Brown, 2009; Heine, 2005; Heine & Hamamura, 2007; Heine, Lehman, Markus, & Kitayama, 1999; Sedikides, Gaertner, & Toguchi, 2003; Sedikides, Gaertner, & Vevea, 2005). Therefore, future research should test whether genuine self-esteem and pure narcissism show different relations with depression in collectivistic versus individualistic cultural contexts.

In the present research, narcissism was assessed with measures that focus predominantly on the grandiose component of narcissism and less on the vulnerable component. In recent years, the distinction between grandiose and vulnerable narcissism has received increasing attention (Miller et al., 2011; Pincus et al., 2009; Pincus & Lukowitsky, 2010). Research suggests that the NPI, which has been used in five of the six studies included in the present research, captures mostly grandiose aspects of narcissism (Ackerman et al., 2011; Maxwell, Donnellan, Hopwood, & Ackerman, 2011; Miller et al., 2011); inspection of the item content of the Narcissistic Personality Questionnaire for Children–Revised (Ang & Raine, 2009) suggests that the same holds for the measure used in the sixth study. The distinction between grandiose and vulnerable narcissism is relevant to the present research because vulnerable, but not grandiose, narcissism might be a risk factor for depression. This hypothesis has yet to be evaluated longitudinally, so future research should use measures of both grandiose and vulnerable narcissism to test whether the vulnerability effect of

low self-esteem holds when controlling for narcissism. However, it should be noted that vulnerable narcissism is strongly correlated with neuroticism (Miller et al., 2011), which raises concerns about the discriminant validity of measures of vulnerable narcissism. Moreover, grandiose narcissism is clearly more central to the construct of narcissism (American Psychiatric Association, 2013); and thus, the present research provides important insights into the effects of narcissism.

Another limitation is the exclusive reliance on self-report measures. Although this is less of an issue with regard to self-esteem (because self-esteem is a subjective construct by definition), ideally future research would test whether the present results hold with nonself-report measures of narcissism and depression (by using informant ratings and clinical interview data). Typically, correlations between measures that are based on the same method (e.g., self-report) are artificially inflated by shared method variance. Note, however, that shared method variance is unlikely to account for the prospective effects between the constructs because shared method variance has already been statistically removed by controlling for concurrent relations and prior levels of the constructs.

The approach of mutually controlling self-esteem and narcissism for each other could be useful with regard to many other research questions on self-esteem, as it is generally important to evaluate whether effects of self-esteem are due to genuine self-esteem or due to narcissistic self-enhancement. For example, longitudinal research suggests that people's self-esteem has consequences for the degree of success and well-being in important life domains such as romantic relationships and working life (Kuster, Orth, & Meier, 2013; Marshall, Parker, Ciarrochi, & Heaven, 2014; Orth, Robins, & Widaman, 2012; Trzesniewski et al., 2006). Future research should test whether these effects hold when the effects of narcissism are controlled for.

In conclusion, the present research contributes to the refinement of the vulnerability model of low self-esteem and depression, by corroborating that the self-esteem effect is truly due to a lack of genuine self-esteem and not due to a lack of narcissistic self-enhancement. Thus, the research significantly strengthens confidence in the validity of the vulnerability model. Identifying vulnerability factors of depression is crucially important because depression can lead to severe consequences for the individual because of impaired functioning in the relationship, work, and health domains (Gotlib & Hammen, 2009), and is predicted to be the leading cause of the global burden of disease by the year 2030 (World Health Organization, 2008). The present research suggests that interventions aimed at increasing self-esteem are worthwhile and likely to reduce risk for the development of depression.

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