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The Narcissism Epidemic Is Dead; Long Live the Narcissism Epidemic.

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The narcissism epidemic is dead; long live the narcissism epidemic

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Keywords:	Narcissism, Narcissistic Personality Inventory, Cohort differences, Generational changes, Measurement invariance

The narcissism epidemic is dead; long live the narcissism epidemic**Abstract**

Are recent cohorts of college students more narcissistic than their predecessors? To address debates about the so-called “narcissism epidemic,” we used data from three cohorts of students ($N_{1990s} = 1,166$; $N_{2000s} = 33,647$; $N_{2010s} = 25,412$) to test whether narcissism levels (overall and specific facets) have increased across generations. We also tested whether our measure, the Narcissistic Personality Inventory (NPI), showed measurement equivalence across the three cohorts, a critical analysis that had been overlooked in prior research. We found that several NPI items were not equivalent across cohorts. Models accounting for non-equivalence of these items indicated a small *decline* in overall narcissism levels from the 1990s to the 2010s ($d = -0.27$). At the facet-level, leadership ($d = -0.20$), vanity ($d = -0.16$), and entitlement ($d = -0.28$) all showed decreases. Our results contradict the claim that recent cohorts of college students are more narcissistic than earlier generations of college students.

Keywords: narcissism, Narcissistic Personality Inventory, cohort differences, generational changes, measurement invariance

Cohort differences in narcissism

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3 Over the past decade, some have suggested that we are living through a “narcissism
4 epidemic” (Twenge, 2006; Twenge & Campbell, 2009; Twenge & Foster, 2008, 2010;
5 Twenge, Konrath, Foster, Campbell, & Bushman, 2008). The widespread acknowledgement
6 of an epidemic has important consequences for educational and occupational practices,
7 insofar that it may promote the tendency to hold a negative portrayal of the current generation
8 of college students. This perspective has gained traction in large part due to the common
9 perception that today’s popular culture encourages individuals to engage in self-inflation (e.g.,
10 Paris, 2014), and the generalized bias to perceive younger individuals as more narcissistic
11 than older individuals (Roberts, Edmonds, & Grijalva, 2010; Trzesniewski & Donnellan,
12 2014). Moreover, the “epidemic” viewpoint has a substantial foothold in the scientific
13 literature focused on emerging adult and personality development (e.g., Malikhao & Servaes,
14 2011; Ong et al., 2011).

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The primary reason given for why the youth of today are more narcissistic than prior generations of students is the historical period in which they were raised (Twenge & Foster, 2008). According to Twenge and Campbell (2009), today’s youth are more narcissistic than previous generations because they grew up in a self-obsessed culture that values the promotion of self-esteem even at the cost of real achievements, leading to “child-centric” parenting practices and school programs that promote self-esteem rather than learning. Another potential influence is changes in the socio-economic environment. According to Bianchi (2014), the period of economic prosperity prior to the recession of 2008 fostered the development of narcissism, which may have been tempered since then.

Despite consistent claims that the cultural climate has shifted fundamentally toward fostering narcissism, the extant empirical research is contradictory. Whereas some have argued for an epidemic of narcissism reflected in increases on measures of narcissism through the early 2000s in the United States (e.g., Twenge et al., 2008), others have argued that if there is change over time and across cohorts, the changes are miniscule (Donnellan &

Cohort differences in narcissism

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3 Trzesniewski, 2009). In fact, the literature is quite mixed with respect to whether narcissism
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5 has increased at all amongst adolescents and emerging adults over recent decades (Barry &
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7 Lee-Rowland, 2015; Donnellan, Trzesniewski, & Robins, 2009; Roberts et al., 2010;
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9 Trzesniewski, Donnellan, & Robins, 2008b).

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There are several limitations of prior research that make it difficult to draw firm conclusions about whether or not there has been a narcissism epidemic. First, the degree to which the Narcissistic Personality Inventory, and other measures of narcissism, assess the same construct across cohorts has not been directly tested. Establishing *measurement invariance* is an important pre-requisite for investigating cross-cohort differences. If a measure is invariant across cohorts, then differences in the means of the measured scales can be interpreted as real differences on the underlying constructs. However, if measurement invariance is violated, differences, or the lack thereof, in the means could be due to differences in the functioning of the items across cohorts.

A second issue concerns the multidimensional nature of the primary measure used in past research, the Narcissistic Personality Inventory (NPI; Raskin & Hall, 1979; Raskin & Terry, 1988). Research to date has focused exclusively on total scores from the NPI, but a number of studies suggest that the NPI is multi-dimensional and that the total score does not do a good job of representing all facets of the construct (Ackerman, Donnellan, Roberts, & Fraley, 2015; Ackerman, Donnellan, & Robins, 2012; Ackerman et al., 2011). Consequently, findings with the total score may be misleading and research is needed to determine whether the facets of narcissism have demonstrated differential change over recent years.

A third issue that has not been commonly taken into account in past research is the ethnic composition of the subsamples within the cross-cohort analyses. Twenge and Foster (2008) reported that Asian Americans scored lower in narcissism than Whites ($d = -0.30$). In addition, African Americans tend to score higher than Caucasians and Asian Americans on narcissism (Foster, Campbell, & Twenge, 2003; Zeigler-Hill & Wallace, 2011). It is possible

Cohort differences in narcissism

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3 that these ethnic differences could mask or enhance changes in narcissism across cohorts,
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5 especially if the ethnic composition of samples changes over time.
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8 Finally, a fourth issue that could influence results on cross-cohort differences is
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10 gender. According to the meta-analysis by Grijalva et al. (2015), men on average score higher
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12 on narcissism than women ($d = 0.26$). The meta-analysis found that the gender difference
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14 stayed stable from 1990 to 2013. Nevertheless, differences in the gender composition of the
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16 samples across cohorts could also influence results on changes in narcissism.
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19 The present study used a multi-stage analytic strategy to examine cohort differences in
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21 overall narcissism as well as in specific facets of narcissism. Specifically, we addressed five
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23 questions not previously examined: 1) Are measures of narcissism equivalent across cohorts?
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25 2) Once equated for additional sources of invariance, do means of overall narcissism differ
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27 across generational cohorts? 3) Do the means of facets of narcissism show generational cohort
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29 differences? 4) Do results for measurement invariance and generational cohort differences
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31 replicate across major ethnic groups? Finally, 5) do results for measurement invariance and
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33 generational cohort differences replicate across gender groups?
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37 The current study examined cross-cohort changes in narcissism over recent decades
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39 using samples from three different universities in the United States. We took advantage of
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41 data from student cohorts gathered in the 1990s, the 2000s, and the early 2010s. While our
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43 main focus is on comparing these cohorts, we also conducted more fine-grained year-by-year
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45 analyses for each of the research questions above. Given the arguments for changes in
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47 narcissism over time, we expected to find increases from the 1990s to the early 2000s
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49 (Twenge & Campbell, 2009).
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51 52 **Method**

53 54 **Samples**

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56 The samples consisted of undergraduates from three American universities: University
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58 of California, Berkeley; University of California, Davis; and the University of Illinois at
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Cohort differences in narcissism

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3 Urbana-Champaign. For consistency with previous studies (Trzesniewski, Donnellan, &
4 Robins, 2008a; Twenge et al., 2008) we analyzed data from undergraduates aged 18 to 24.
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6 Table 1 shows the sample sizes, year of data collection, percentage of females, and percentage
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8 of five ethnicities in each sample. Data from the 1990s cohort were collected only at the
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10 University of California, Berkeley, whereas data from the 2000s and 2010s cohorts were
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12 collected at the University of California, Davis and the University of Illinois at Urbana-
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14 Champaign¹. The percentage of females was higher in the 2000s (66%) and 2010s (69%)
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16 cohorts compared with the 1990s cohort (57%).
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55 ¹ Data from the University of California campuses from the years 2002 up to 2008 have been
56 used in the following publications: Ackerman et al. (2012); Ackerman et al. (2011);
57 Donnellan et al. (2009); Roberts et al. (2010); Trzesniewski et al. (2008b); Twenge and Foster
58 (2008). Data from the University of Illinois at Urbana-Champaign from 2009 were also
59 analyzed in Roberts et al. (2010).
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Cohort differences in narcissism

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Table 1

Undergraduate Samples from Three Universities

Cohort	Year of data collection	N	% Female	Ethnicity			% mixed or other	University	
				% Caucasian	% Asian	% African American			
1990s	1992	498	55	36	42	7	14	1	UCB
	1996	668	58	29	45	5	14	8	UCB
Total 1990s		1,166							
2000s	2002	3,191	69	36	37	2	8	17	UCD
	2003	4,830	67	34	38	2	9	17	UCD
	2004	4,766	66	32	40	2	9	17	UCD
	2005	4,427	66	30	40	2	10	18	UCD
	2006	4,987	67	27	42	2	10	19	UCD
	2007	3,765	64	25	43	2	11	20	UCD
	2008	2,410	68	24	44	2	11	19	UCD
	2009	5,271	66	35	42	2	10	12	UCD, UIUC
	Total 2000s		33,647						
2010s	2010	4,475	68	34	24	26	0	16	UCD, UIUC
	2011	4,148	67	33	43	2	0	22	UCD, UIUC
	2012	4,222	66	31	44	2	9	14	UCD, UIUC
	2013	4,849	70	29	46	2	12	11	UCD
	2014	4,273	70	29	46	2	13	11	UCD
2015	3,445	72	26	45	2	14	13	UCD	
Total 2010s		25,412							

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Cohort differences in narcissism

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Note. For all samples only participants aged between 18 and 24 were included in the analyses. UCB = University of California, Berkeley, UCD = University of California, Davis, UIUC = University of Illinois at Urbana-Champaign.

For Review Only

Cohort differences in narcissism

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Instrument

Narcissism was assessed with the Narcissistic Personality Inventory (Raskin & Hall, 1979; Raskin & Terry, 1988). The NPI consists of 40 item pairs that are presented in a forced-choice format. Participants are instructed to choose the item that is closest to their feelings and beliefs from each pair. In the 1992 sample, only 32 of the 40 NPI items were administered. In all other samples the full NPI was administered.

Analyses

We first conducted pre-analyses of the NPI items with all available data in order to establish the appropriate factor structure on which to base further analyses of mean differences. To examine cross-cohort changes in narcissism, we estimated latent mean differences on overall narcissism and facets of narcissism controlling for measurement invariance. The analyses on latent means were conducted with the whole sample and again separately for major ethnic groups as well as separately for men and women. All analyses were based on the item set of 32 items available in all samples.

Pre-analyses on NPI Factor Structure

The factor structure of the NPI was investigated using exploratory structural equation modeling (ESEM; Asparouhov & Muthen, 2009) in Mplus (Version 7.4; Muthén & Muthén, 1998-2014). An exploratory version of the Thurstonian item response model (Brown & Maydeu-Olivares, 2011) was applied to account for the forced-choice nature of the items (see also Wetzels, Roberts, Fraley, & Brown, 2016). We evaluated factor models with one to six factors regarding their goodness of fit and the interpretability of the factors. Model fit was evaluated using the root mean square error of approximation (RMSEA; Steiger, 1990) and the comparative fit index (CFI; Bentler, 1990). For the RMSEA, values below .08 indicate reasonable fit and values below .06 indicate close fit (Browne & Cudeck, 1993). For the CFI, values above .90 (.95) indicate acceptable (good) model fit (Hu & Bentler, 1999). In general,

Cohort differences in narcissism

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3 with sample sizes as large as ours, the RMSEA is more informative than the CFI for
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5 evaluating model fit because it is sample size independent (Meade, Johnson, & Braddy, 2008)
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7 and was therefore given more weight over the CFI for evaluating model fit. Given prior
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9 research showing that the NPI is not unidimensional (e.g., Ackerman et al., 2011), we did not
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11 expect the fit of the unidimensional model to be good (see also Wetzel et al., 2016). Items
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13 were assigned to a factor if at least 12% of their variance was explained by the respective
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15 factor (i.e., the factor loading in the forced-choice format was $\geq .25$).
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18 Cohort Differences Based on Latent Mean Scores

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21 To test for cohort differences, we estimated latent means for narcissism at the overall
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23 and facet level in structural models. For any comparisons of mean trait levels between the
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25 cohorts, one must first ensure that the traits are measured on the same scale; thus,
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27 measurement invariance of the NPI across the cohorts must be established. Different degrees
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29 of measurement invariance are distinguished: 1) configural, 2) metric, 3) scalar, and 4) strict
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31 invariance (Meredith, 1993). Configural invariance holds when the same general factor
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33 structure holds across cohorts (i.e., the number of factors and the items loading on them are
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35 the same). Metric invariance holds when items are related to factors in the same way across
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37 cohorts (i.e., factor loadings are equal). Scalar invariance holds when, in addition to factor
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39 loadings, the observed means of the items are equal conditional on the trait level (i.e., item
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41 intercepts are equal). Finally, strict invariance holds when, in addition to equality of factor
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43 loadings and intercepts, the amount of variance in the items not accounted for by the factor is
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45 the same across cohorts (i.e., item residual variances are equal). In order to interpret mean
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47 differences on the factors, scalar invariance is needed. However, it is possible that
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49 measurement invariance does not hold for the whole item set due to several items with non-
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51 invariant properties across cohorts. In this case, a *partial invariance* model may be imposed
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53 in which the non-invariant items are allowed to have different parameters across cohorts
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Cohort differences in narcissism

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3 while all other items are constrained invariant. In the partial invariance model, the invariant
4 items establish a common metric across groups (Reise, Widaman, & Pugh, 1993). This
5 control for non-invariance ensures that comparisons of mean levels across groups are
6 meaningful (Byrne, Shavelson, & Muthen, 1989; Steenkamp & Baumgartner, 1998).
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8 Estimates of mean differences from this model are unbiased when there are few non-invariant
9 items (Guenole & Brown, 2014) relative to the number of invariant items.
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16 The approach taken in this study was to start with a model of strict invariance².
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18 Modification indices were then inspected to find items that violated invariance, either in the
19 factor loadings or intercepts. Although statistical significance is an essential criterion for non-
20 invariance of item parameters, the effect size should be taken into account as well. To this
21 purpose, we applied the classification system for non-invariance (or differential item
22 functioning) developed by Educational Testing Service (ETS; Zieky, 1993), which is used as
23 the gold standard in research on measurement invariance. It classifies items into three
24 categories: no or negligible non-invariance (A), slight to moderate non-invariance (B), and
25 moderate to large non-invariance (C). We transformed the cut-off values for the categories
26 from the delta metric used by ETS to cut-offs for factor loadings (A: loading < 0.15, B: 0.15
27 ≤ loading < 0.25, C: loading ≥ 0.25) and item intercepts (A: intercept < 0.25, B: 0.25 ≤
28 intercept < 0.375, C: intercept ≥ 0.375) in the context of the Thurstonian item response
29 model. Item parameters which exhibited at least slight to moderate non-invariance (B and C
30 items) were released iteratively across cohorts, starting with the parameter with the largest
31 modification index. Then, the partial invariance model was re-estimated and the next
32 parameter was freed until all parameters with at least slight to moderate non-invariance had
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56 ² Although scalar invariance would normally suffice, categorical responses in the NPI's
57 forced-choice format require the residual variances of the items to be fixed to 1 in all cohorts
58 in order for the model to be identified.
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3 been freed³. The final partial invariance model was estimated to examine mean differences
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5 across cohorts. Differences in the latent means on narcissism or the narcissism facets found in
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7 the partial invariance models indicate whether any changes have occurred from the 1990s to
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9 the 2010s cohorts. In these models, the means of the first cohort (1990s) are fixed to 0 for
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11 model identification. Thus, the estimates for the other two cohorts indicate mean differences
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13 relative to the baseline of the 1990s cohort. The same analyses were conducted at the year-
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15 by-year level (1992, 1996, and then all consecutive years from 2002 to 2015). This allows a
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17 more fine-grained analysis of the measurement invariance of the NPI and the mean
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19 differences on narcissism and the narcissism facets from 1992 to 2015. We additionally ran
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21 latent growth curve models on the year-by-year data to examine the overall trend.
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26 In addition to investigating the non-invariance of individual items (differential item
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28 functioning), we checked whether the test scores for overall narcissism or the narcissism
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30 facets were invariant across cohorts (differential test functioning). To obtain an effect size
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32 for non-invariance at the scale level, we divided the largest difference in the sum of the
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34 response probabilities across all items by the pooled standard deviation of the compared
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36 cohorts. All measurement invariance models were estimated in Mplus (Version 7.4; Muthén
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38 & Muthén, 1998-2014).
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40 41 42 **Results**

43 44 **Establishing the NPI's Factor Structure**

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46 We identified three factors in the pre-analyses of the pooled data, and interpreted them
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48 as leadership, vanity, and entitlement⁴. This is consistent with previous analyses of the NPI's
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52 ³ Effect size was prioritized over the value of the modification index because the latter is
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54 sample-size dependent. For example, if the largest modification index belonged to a
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56 parameter with negligible non-invariance, this parameter was not freed but rather the next one
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58 with at least slight to moderate non-invariance was freed instead.

59
60 ⁴ When the full 40-item set (available from 1996 on) was used, the same three factors were
differentiated. In the 40-item set, more items loaded on leadership (23 in total) while the
vanity and entitlement items were an exact match to the respective factors in the 32-item set.

Cohort differences in narcissism

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3 factor structure that found the same or similar facets (Ackerman et al., 2015; Ackerman et al.,
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5 2011; Emmons, 1984; Wetzels et al., 2016). Table S1 in the Supplemental Material available
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7 online contains the factor loadings for all NPI items. Of the 32 available items, 26 showed
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9 standardized loadings $\geq .25$ and were therefore included in the facet-level analyses. Of these
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11 26 items, eight items loaded on more than one facet. Specifically, four items loaded on
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13 leadership and vanity, three items loaded on leadership and entitlement, and one item loaded
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15 on vanity and entitlement. Thus, in total, 13 items loaded on leadership, 12 on vanity, and 9
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17 on entitlement. The cross-loadings were included in all models.
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20 21 **Is the NPI Equivalent across Cohorts and Years?**

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23 First, we tested whether the NPI showed measurement equivalence across the three
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25 cohorts. Table S2 in the Supplemental Material available online shows the model fit indices
26
27 of the measurement invariance models. The strict invariance model for a single factor, overall
28
29 narcissism, yielded a good fit to the data according to the RMSEA (RMSEA = .02), though
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31 the fit was less than acceptable according to the CFI (CFI = .77), which is consistent with
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33 previous research on the NPI (Wetzels et al., 2016). Four out of the 32 NPI items
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35 demonstrated non-invariance with respect to the item intercepts across cohorts (see Table S3
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37 in the Supplemental Material available online). All non-invariant items pertained to the 1990s
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39 cohort. That is, these items differed in their measurement properties between the 1990s and
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41 the 2000s and 2010s cohorts, but not between the 2000s and 2010s cohorts. Three out of the
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43 four non-invariant intercepts had a slight to moderate effect size and one had a moderate to
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45 large effect size. This indicates that the observed means on these items (conditional on the
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47 trait level) differed across cohorts. The item with the largest difference in observed means
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49 was “I am no better or no worse than most people. – I think I am a special person.” (item 9),
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51 with the 1990s cohort endorsing the second (narcissistic) option more frequently after
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controlling for overall narcissism. Despite these non-invariant items, overall narcissism did not show differential test functioning ($d = 0.05$).

The multidimensional model also showed a good fit according to the RMSEA (RMSEA = .01) and a much better fit than the unidimensional model according to the CFI (CFI = 0.88). This is consistent with previous model-based analyses of the NPI facets (Wetzel et al., 2016). Table 2 shows items with non-invariant factor loadings and intercepts at the facet level. Similar to the unidimensional model, most of the cases of non-invariance pertained to the 1990s cohort only, indicating that relationships of items to factors and observed means on several items differed between the 1990s cohort and the other two cohorts, whereas invariance held between the 2000s and the 2010s cohort. Most of the non-invariant items belonged to the vanity facet. Additionally, the majority of the non-invariant items yielded different intercepts, which is the key parameter for comparing scores across cohorts. The effect sizes for non-invariant intercepts ranged from slight to moderate (0.25, item 12) to moderate to large (0.55, item 9). At the facet level, leadership and vanity showed small differential test functioning ($d = 0.16$ for both on the comparison of 1990s with 2010s) whereas entitlement was invariant. Thus, despite some non-invariant items, entitlement as a scale appeared to function equivalently across cohorts.

The year-by-year analysis with 16 groups (1992, 1996, 2002 – 2015) confirmed that most of the non-invariant parameters occurred for the 1990s cohorts (1992 and 1996). For overall narcissism, 16 parameters had to be freed (13 intercepts, 3 loadings). For the facets, 32 parameters had to be freed (14 intercepts, 18 loadings). Detailed results can be found in the Supplemental Material Tables S4 (model fit indices), S5 (non-invariant items for overall narcissism, and S6 (non-invariant items for facets of narcissism).

Thus, we found evidence for partial invariance for both overall narcissism and for the facets of narcissism. This indicated that a subset of the items was not being responded to in

Cohort differences in narcissism

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3 the same way across the three cohorts. When the partial invariance model was estimated,
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5 cohort mean differences were practically identical with those in the invariance model
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8 constraining all parameters for overall narcissism (see Table 3). This is because the test as a
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10 whole functioned equivalently across cohorts, as negligible differential test functioning
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12 results showed. When examining the facets of narcissism, we found that the leadership and
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14 vanity scores were slightly affected by measurement non-invariance. Fortunately, the partial
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16 invariance model can still be used to estimate latent means on narcissism for the cohorts,
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18 which we turn to next.
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20 **Are There Mean Differences across Cohorts/Years on Overall Narcissism?**

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22 Our second research question pertained to whether any mean differences in narcissism
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24 existed across cohorts. Inconsistent with the hypothesis that students should be increasing in
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26 narcissism between the 1990s and early 2000s, the estimates of latent mean differences
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28 indicated that the 2000s cohort showed a slight, but significant, decrease from the early 1990s
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30 ($d = -0.12$, 95% CI $[-0.18, -0.06]$; see Table 3). Furthermore, the 2010s cohort reported
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32 significantly lower overall narcissism than the 1990s cohort ($d = -0.27$, 95% CI $[-0.33, -$
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34 $0.21]$). This indicates a small and continuous decline in overall narcissism from the 1990s to
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36 the 2010s (see also solid black line in Figure 1).
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41 The year-by-year analysis allows a more fine-grained depiction of the development
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43 from 1992 to 2015. As Figure 2 and Table S7 show, there were only non-significant
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45 fluctuations in overall narcissism from 1992 to 2013 (all $d \leq |0.11|$). Significant mean
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47 differences only occurred for 1992 vs. 2014 ($d = -0.17$, 95% CI $[-0.26, -0.07]$) and 1992 vs.
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49 2015 ($d = -0.15$, 95% CI $[-0.24, -0.05]$)⁵. Nevertheless, the overall trend from latent growth
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51 curve models of the year-by-year data indicated a decrease in overall narcissism from 1992 to
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55 ⁵ Note that the results from the cohort analysis and the year-by-year analysis are not directly
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57 comparable because in the year-by-year analysis more item parameters and – in part –
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59 different item parameters had to be freed to obtain the final partial invariance model
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61 compared with the cohort analysis.

Cohort differences in narcissism

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3 2015 (see Supplemental Material Table S8), which is consistent with our findings from the
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5 cohort analysis.

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8 An analysis of the differences between year groups broken down by campus can be
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10 found in Supplemental Table S9 and Supplemental Figures S1 to S3. In summary, students
11
12 from the University of California campuses students showed a decline in overall narcissism
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14 whereas no significant differences were found for students from the University of Illinois at
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16 Urbana-Champaign. In addition, we included figures of the mean scores and mean score
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18 differences for the cohorts and year-by-year analyses in the supplemental material in order to
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20 allow readers a comparison with the traditional scoring method (see Figures S4 to S11). The
21
22 overall pattern is consistent with our model-based estimates of mean differences and also
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24 indicates a small decline in narcissism from the 1990s to the 2010s or from 1992 to 2015,
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26 respectively. However, it is important to note that the mean scores do not control for non-
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28 invariance. Therefore, the latent mean differences are more appropriate for interpretation.
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Cohort differences in narcissism

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Table 2

Non-invariant Items in Facets Models for 1990s vs. 2000s vs. 2010s

Model	Trait	Item number	Item content	Cohort	Type	Effect size	Category
Full invariance	Leadership, Vanity	9	I am no better or no worse than most people. - I think I am a special person.	1990s	Intercept	0.55	C
Partial 1	Entitlement	10	I am not sure if I would make a good leader. - I see myself as a good leader.	1990s	Loading	-0.24	B
Partial 2	Vanity	4	When people compliment me I sometimes get embarrassed. - I know that I am good because everybody keeps telling me so.	1990s	Intercept	-0.30	B
Partial 3	Vanity	28	I don't very much care about new fads and fashions. - I like to start new fads and fashions.	1900s	Intercept	-0.25	B
Partial 4	Vanity	15	I don't particularly like to show off my body. - I like to display my body.	1990s	Intercept	-0.27	B
Partial 5	Leadership, Vanity	30	I really like to be the center of attention. - It makes me uncomfortable to be the center of attention.	2010s	Intercept	-0.27	B
Partial 6	Leadership	12	I like having authority over people. - I don't mind following orders.	1990s	Intercept	0.25	B

Note. Items were freed iteratively. Thus, in model partial 1, the intercept of item 9 was freed for the 1990s cohort. In model partial 2, the loading

of item 10 was additionally freed in the 1990s cohort, and so on. The last column classifies the items as having slight to moderate non-invariance

(B) or moderate to large non-invariance (C). For intercepts, a positive (negative) sign of the effect size indicates that the cohort for which this

item's intercept is non-invariant has a higher (lower) probability of selecting the narcissistic response option in the pair. The non-invariant

loading on entitlement indicates that for the 1990s, the slope of the curve relating the trait level to the probability of selecting the narcissistic

response option is steeper compared with the other cohorts.

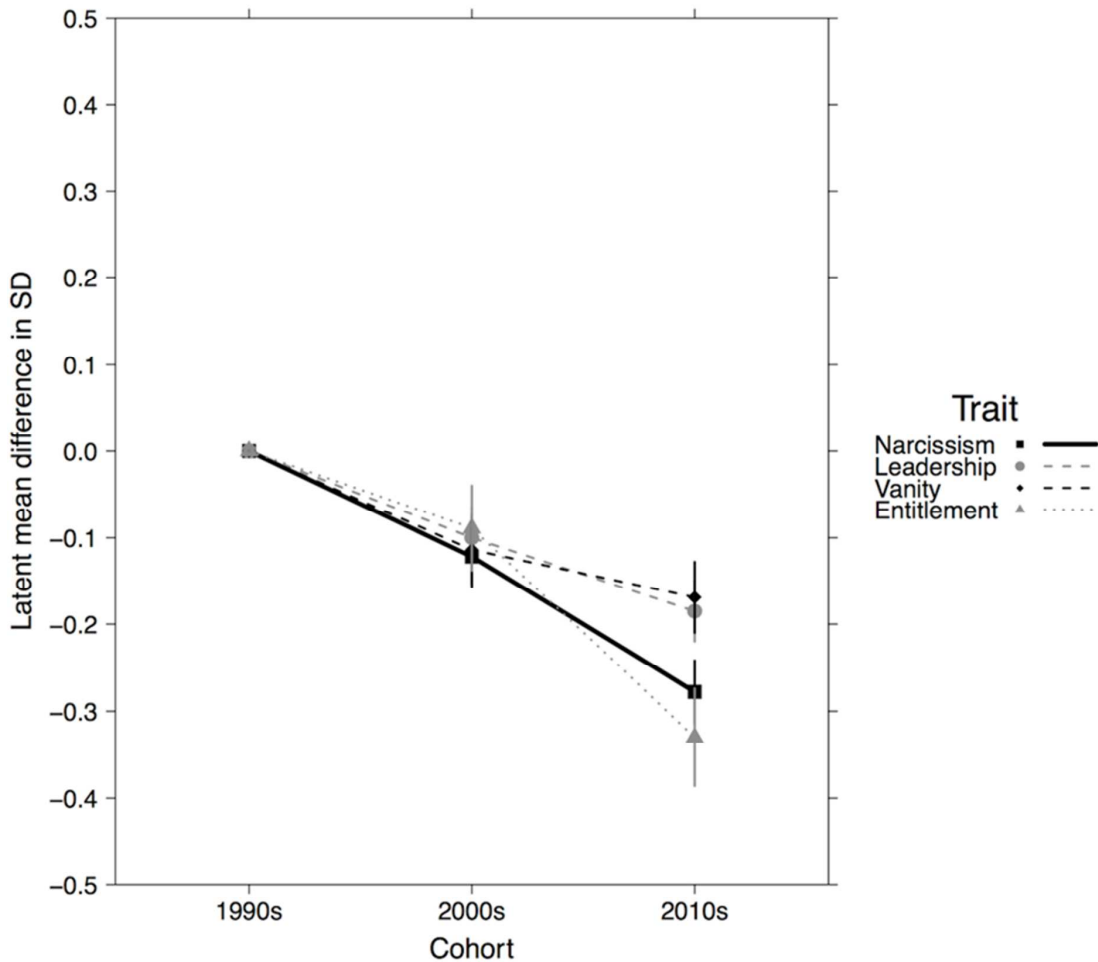
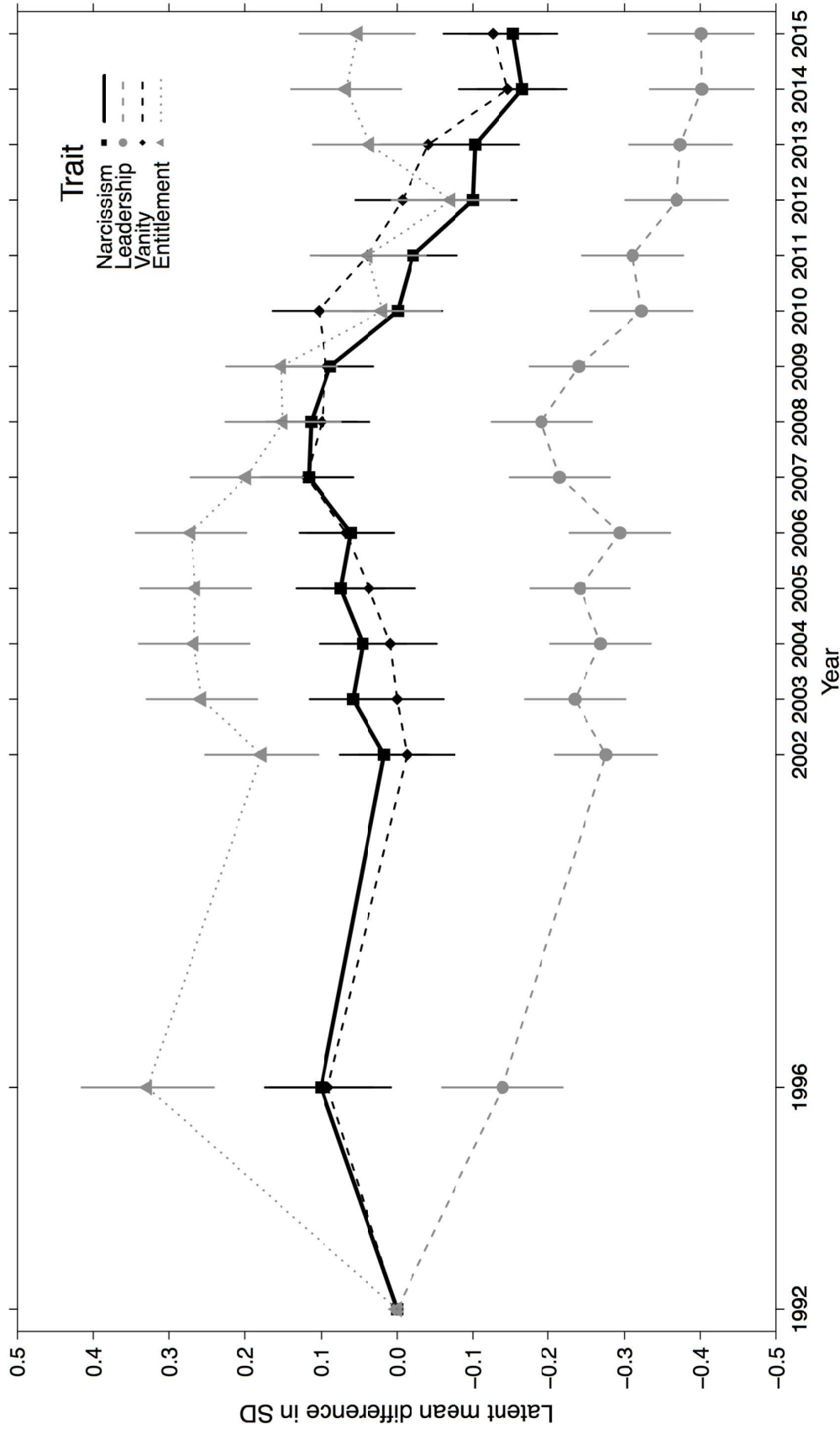


Figure 1. Latent means estimated in partial measurement invariance models for overall narcissism (solid black line) and the facets by cohorts. The means of the 1990s cohort were constrained to 0 for model identification. Mean differences between the 1990s and the 2000s or 2010s cohorts can be interpreted as standard deviations.

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Cohort differences in narcissism

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Cohort differences in narcissism

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Figure 2. Latent means estimated in partial measurement invariance models for overall narcissism (solid black line) and the facets by years. The means of the 1992 group were constrained to 0 for model identification. Mean differences between 1992 and the other year groups can be interpreted as standard deviations.

For Review Only

Cohort differences in narcissism

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Are There Mean Differences across Cohorts/Years on the Narcissism Facets?

Our third research question was whether changes in the facets of narcissism revealed a more complex picture of change across generational cohorts. Like the overall NPI score, at the facet level we found evidence to contradict the hypothesis that narcissism was on the increase from the early 1990s to the early 2000s. When estimates of the final partial invariance model were used, we found a significant but very small decrease in leadership ($d = -0.11$, 95% CI $[-0.17, -0.05]$) and vanity ($d = -0.11$, 95% CI $[-0.17, -0.05]$). The 2000s cohort did not differ significantly from the 1990s cohort on entitlement (see partial invariance models in Table 3). Contrary to the idea of a narcissism epidemic, the 2010s cohort reported lower leadership ($d = -0.20$, 95% CI $[-0.26, -0.14]$), lower vanity ($d = -0.16$, 95% CI $[-0.22, -0.10]$), and lower entitlement ($d = -0.28$, 95% CI $[-0.33, -0.22]$) than the 1990s cohort, reflecting a small decline in all narcissism facets⁶. Figure 1 illustrates these latent mean differences across cohorts.

The year-by-year level analyses indicated that the largest portion of these decreases occurred during the late 2000s and early 2010s (see Figure 2). Leadership showed a steady decline from 1992 to 2015. For example, the mean difference between 1992 and 2005 was $d = -0.24$, 95% CI $[-0.33, -0.14]$ and between 1992 and 2015 it was $d = -0.38$, 95% CI $[-0.48, -0.28]$. For vanity and entitlement, the pattern is less clear. Vanity showed non-significant fluctuations for the whole period from 1992 to 2013. Only the mean difference between 1992 and 2014 was significant ($d = -0.14$, 95% CI $[-0.24, -0.05]$). Entitlement showed slight increases up to 2007. From 2008 to 2015, mean entitlement levels did not differ significantly from those in 1992 (see Supplemental Material Table S7 for full results on year-by-year mean differences). The latent growth curve models of all facets indicated decreases with models modeling quadratic growth showing significantly better fit than the models including only a

⁶ When the partial invariance model was re-estimated without the two most non-invariant items (4 and 9), estimates of latent mean differences nevertheless stayed practically the same.

Cohort differences in narcissism

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3 linear slope (see Supplemental Material Table S8). To control for the potential effect of
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5 campus, we also did the year-by-year analysis separately for each campus. The results for
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7 mean differences by campus can be found in Supplemental Table S9 and Figures S1 to S3⁷.
8
9 In summary, University of California, Berkeley students showed a decline in vanity between
10
11 1992 and 1996 whereas leadership and entitlement did not change significantly. University of
12
13 California, Davis students showed a decrease on all traits from 2002 to 2015. None of the
14
15 mean differences between 2009 and 2012 were significant for University of Illinois at
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17 Urbana-Champaign students, though these samples were the smallest and accordingly had the
18
19 largest standard errors.
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22 **Do Results Replicate Across Ethnic Groups?**

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25 Our fourth research question was to investigate whether ethnicity influenced results
26
27 on cross-cohort measurement invariance and generational changes. Therefore, we estimated
28
29 all invariance models for overall and facet-level narcissism separately for major ethnic
30
31 groups. First, we divided the sample into Asians and non-Asians since it has been suggested
32
33 that a large Asian sample might hinder finding increases in narcissism. It is unclear what
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35 effect, if any, including Asian samples in the analyses would have on decreases in narcissism.
36
37 Second, we ran the analyses separately for Caucasians, Asians, and African Americans since
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39 differences in narcissism scores have been reported for these ethnic groups. This latter
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41 comparison only included the 2000s and 2010s cohorts because the sample size for African
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43 Americans was too small in the 1990s cohort ($N = 60$).
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47 *Asians and non-Asians.* Model fit was similar to that reported for the analyses with
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49 the whole sample (i.e., good according to RMSEA, and less than acceptable for CFI; see
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51 Table S2). For the Asian sample, seven items were non-invariant between the 1990s and the
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56 ⁷ In addition to the separate analyses for overall narcissism and the facets, we also ran bi-
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58 factor models at the cohorts and year-by-year level. The results are shown in the
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60 Supplemental Material Table S10 and S11.

Cohort differences in narcissism

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3 other two cohorts for overall narcissism. Three items were non-invariant in the invariance
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5 models analyzing only the non-Asian sample (see Table S3). In the multidimensional models,
6
7 seven items showed non-invariance for Asians including the intercept of item 9, which
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9 showed moderate to large non-invariance. For non-Asians, the multidimensional models
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11 revealed that eight items were non-invariant including the intercept of item 9 (see Table 2).
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14 For Asians, overall narcissism did not show significant changes from the 1990s to the
15
16 2010s ($d = -0.10$, 95% CI $[-0.19, 0]$). For non-Asians, the final partial invariance model
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18 indicated a small to moderate decline in overall narcissism from the 1990s to the 2010s ($d = -$
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20 0.36 , 95% CI $[-0.44, -0.27]$). Thus, including Asian samples attenuated the overall decrease
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22 in narcissism.
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25 In contrast to the overall findings, Asians showed a small increase in vanity from the
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27 1990s to the 2000s ($d = 0.18$, 95% CI $[0.08, 0.27]$) and a further slight increase between the
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29 2000s and the 2010s to an overall d of 0.21 (95% CI $[0.12, 0.31]$) between the 1990s and the
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31 2010s. Consistent with the overall pattern, they showed a small decline in leadership ($d = -$
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33 0.22 , 95% CI $[-0.31, -0.12]$). However, there were no significant changes in entitlement. The
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35 non-Asian sample showed a negligible to small decrease in leadership between the 1990s and
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37 the 2010s ($d = -0.16$, 95% CI $[-0.24, -0.07]$). In contrast to the Asian sample, non-Asians did
38
39 not show a significant change on vanity, but instead showed a small to moderate decrease in
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41 entitlement ($d = -0.40$, 95% CI $[-0.49, -0.32]$). Importantly, this decrease already started
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43 between the 1990s and 2000s and only continued more strongly between the 2000s and 2010s
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45 (see Table 3).
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49 Overall, the effects of decreasing means on the facets of narcissism for the non-Asian
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51 subsample were slightly stronger than those reported for the whole sample with the exception
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53 of vanity, where no change was found. The Asian subsample showed a pattern of results that
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3 differed from the non-Asian subsample, in particular with respect to an increase on the vanity
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5 facet.

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7 ***Caucasians, Asians, and African Americans.*** Model fit was good according to the
8
9 RMSEA and less than acceptable according to the CFI for all models (see Table S12 in the
10
11 Supplemental Material). For Caucasians and Asians, full invariance held in both the overall
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13 narcissism and facets models. For African Americans, four items showed non-invariance
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15 between the 2000s and the 2010s cohort in the models on overall narcissism and three items
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17 in the models on the facets of narcissism (see Table S13 in the Supplemental Material).
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21 Table 4 shows latent mean differences between the 2000s and the 2010s cohorts on
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23 overall narcissism and the facets. For the Caucasian and Asian subsamples, the mean
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25 difference on overall narcissism was consistent with the results on the whole sample and the
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27 Asian/non-Asian comparison, indicating a negligible to small, but significant, decline in
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29 narcissism ($d = -0.12$, 95% CI $[-0.15, -0.09]$ for Caucasians and $d = -0.06$, 95% CI $[-0.08, -$
30
31 $0.03]$ for Asians). In contrast, a moderate to strong decrease in overall narcissism was found
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33 for the African American subsample ($d = -0.55$, 95% CI $[-0.64, -0.46]$). The mean
34
35 differences at the facet level were similar between the Caucasian and Asian subsamples
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37 regarding leadership and entitlement, indicating a negligible to small decline on both facets
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39 (see Table 4). Whereas Caucasians showed a slight decrease in vanity ($d = -0.09$, 95% CI $[-$
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41 $0.12, -0.06]$), Asians showed no change ($d = 0.04$, 95% CI $[0.01, 0.07]$). The facet level
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43 results for African Americans showed that the moderate to strong decrease found for overall
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45 narcissism was mainly due to a decrease in leadership ($d = -0.59$, 95% CI $[-0.68, -0.50]$)
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47 from the 2000s to the 2010s whereas the decreases in vanity ($d = -0.28$, 95% CI $[-0.37, -$
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49 $0.19]$) and entitlement were less pronounced ($d = -0.25$, 95% CI $[-0.34, -0.16]$).
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55 In sum, all ethnic groups showed decreases in overall narcissism and leadership from
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57 the 2000s to the 2010s, though they were strongest for African Americans. All ethnic groups
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Cohort differences in narcissism

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furthermore showed a slight decline in entitlement. For vanity, results differed across ethnic groups, with no change for Asians, and a small decrease for African Americans and Caucasians.

Do Results Replicate for Men and Women?

Our final research question addressed whether results on measurement invariance and cohort/year group differences on narcissism differed between men and women. We summarize the results on mean differences here and refer the interested reader to the detailed results in the online Supplemental Material (Tables S14 to S16). For women, mean overall narcissism levels decreased from the 1990s to the 2010s ($d = -0.24$, 95% CI $[-0.32, -0.16]$). For men, the decline in overall narcissism was slightly smaller, though not significantly so ($d = -0.17$, 95% CI $[-0.26, -0.08]$). At the facet level, both gender groups showed similar decreases in leadership ($d = -0.25$, 95% CI $[-0.33, -0.18]$ for women, $d = -0.19$, 95% CI $[-0.28, -0.09]$ for men) and entitlement ($d = -0.22$, 95% CI $[-0.29, -0.14]$ for women, $d = -0.24$, 95% CI $[-0.33, -0.15]$ for men). In contrast, only women showed a decline in vanity ($d = -0.18$, 95% CI $[-0.25, -0.10]$), whereas mean levels for men did not change significantly.

Cohort differences in narcissism

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Facets												
Leader-ship	full	-0.16 [-0.26; -0.06]	1.03	-0.16 [-0.24; -0.07]	-0.32 [-0.42; -0.22]	1.05	-0.30 [-0.39; -0.22]	-0.14				
	partial	-0.02 [-0.12; 0.07]	1.01	-0.02 [-0.11; 0.06]	-0.16 [-0.26; -0.06]	1.02	-0.16 [-0.24; -0.07]	-0.14				
Vanity	full	-0.16 [-0.26; -0.05]	1.11	-0.14 [-0.23; -0.06]	-0.33 [-0.44; -0.22]	1.16	-0.29 [-0.37; -0.20]	-0.15				
	partial	0.07 [-0.05; 0.18]	1.11	0.06 [-0.02; 0.14]	-0.09 [-0.20; 0.03]	1.16	-0.08 [-0.16; 0.01]	-0.14				
Entitle-ment	full	-0.19 [-0.31; -0.06]	1.21	-0.15 [-0.24; -0.07]	-0.45 [-0.59; -0.30]	1.15	-0.39 [-0.48; -0.30]	-0.24				
	partial	-0.22 [-0.36; -0.08]	1.29	-0.17 [-0.25; -0.08]	-0.49 [-0.66; -0.33]	1.22	-0.40 [-0.49; -0.32]	-0.23				

Note. Asian subsample $N = 24,395$; non-Asian subsample $N = 35,335$, Full = strict invariance model in which parameters for all items were

constrained, Partial = final strict invariance model in which non-invariant parameters were freed. Brackets indicate 95% confidence intervals.

Significant ($\alpha = 0.05$) latent mean differences are bold and in italics.

Table 4

Latent Mean Differences and Cohen's d for 2000s vs. 2010s for Caucasian, Asian, and African American Subsamples

	Invariance model	2000s – 2010s		
		<i>M</i> [95% CI]	<i>SD</i>	Cohen's <i>d</i> [95% CI]
Caucasian subsample				
Overall narcissism	full	<i>-0.13</i> [-0.16; -0.10]	1.03	-0.12 [-0.15; -0.09]
Facets				
Leadership	full	<i>-0.06</i> [-0.10; -0.03]	1.00	-0.06 [-0.09; -0.03]
Vanity	full	<i>-0.09</i> [-0.13; -0.05]	1.03	-0.09 [-0.12; -0.06]
Entitlement	full	<i>-0.17</i> [-0.22; -0.13]	1.02	-0.17 [-0.20; -0.14]
Asian subsample				
Overall narcissism	full	<i>-0.06</i> [-0.09; -0.03]	1.02	-0.06 [-0.08; -0.03]
Facets				
Leadership	full	<i>-0.05</i> [-0.09; -0.02]	1.03	-0.05 [-0.08; -0.03]
Vanity	full	<i>0.04</i> [0.01; 0.07]	1.03	0.04 [0.01; 0.07]
Entitlement	full	<i>-0.15</i> [-0.18; -0.11]	0.91	-0.16 [-0.19; -0.14]
African American subsample				
Overall narcissism	full	<i>-0.61</i> [-0.73; -0.49]	1.11	-0.55 [-0.64; -0.46]
	partial	<i>-0.61</i> [-0.73; -0.49]	1.11	-0.55 [-0.64; -0.46]
Facets				
Leadership	full	<i>-0.67</i> [-0.79; -0.54]	1.10	-0.61 [-0.70; -0.52]
	partial	<i>-0.65</i> [-0.78; -0.53]	1.10	-0.59 [-0.68; -0.50]
Vanity	full	<i>-0.32</i> [-0.44; -0.20]	1.07	-0.30 [-0.39; -0.21]
	partial	<i>-0.30</i> [-0.42; -0.18]	1.07	-0.28 [-0.37; -0.19]
Entitlement	full	-0.18 [-0.31; -0.06]	0.94	-0.20 [-0.28; -0.11]
	partial	-0.22 [-0.34; -0.11]	0.88	-0.25 [-0.34; -0.16]

Note. Caucasian subsample $N = 17,883$; Asian subsample $N = 23,952$; African American subsample $N = 2,260$; Full = strict invariance model in which parameters for all items were constrained; Partial = final strict invariance model in which non-invariant parameters were freed. Brackets indicate 95% confidence intervals. Significant ($\alpha = 0.05$) latent mean differences are bold and in italics.

Discussion

Cohort differences in narcissism

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3 The present study evaluated the claim that the United States faces a narcissism
4 epidemic among young people, with dramatically rising rates of narcissism occurring over
5 the past few decades. Contrary to this claim, we found evidence that narcissism levels have
6 been slowly declining from the 1990s to the 2010s. Six features of our research make this
7 finding particularly compelling. First, our results are based on a very large sample of
8 students from three different universities. Second, the decline was evident both for overall
9 narcissism levels and for the specific facets of leadership, vanity, and entitlement. Third, the
10 decline persisted after controlling for measurement non-invariance. Fourth, the decline was
11 continuous over time, indicating that there was no rise in narcissism before purported
12 historical factors such as the recession of 2008. Fifth, the decline held for major ethnic groups
13 and no ethnic group showed the overall increase predicted by proponents of the narcissism
14 epidemic. Sixth, the findings were consistent across men and women.

30 **The Importance of Measurement Invariance**

31
32 In the current study, we considered for the first time whether students from different
33 cohorts reacted similarly to the items on the NPI. We found pervasive measurement non-
34 invariance across multiple items. This indicates that some of the NPI's items changed their
35 meaning over time and undergraduates changed the way they interpreted these items across
36 generational cohorts. For example, item 9 (I am no better or no worse than most people. - I
37 think I am a special person.) showed strong non-invariance regarding its intercept. Students
38 with equal trait levels on vanity, but from the 1990s, endorsed the narcissistic response option
39 (I think I am a special person) more frequently than students from the 2000s and 2010s.
40
41 However, despite containing multiple items that showed measurement non-invariance, the
42 overall narcissism score was not adversely affected.

54 On the other hand, the effect of measurement non-invariance was more substantial for
55 two of the facets of narcissism, leadership and vanity. Leadership and vanity showed non-
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Cohort differences in narcissism

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3 invariance both at the level of individual items and at the scale level, indicating that means
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5 from a traditional scoring approach would be biased. Importantly, this bias can go in both
6
7 directions. In our model-based analyses, the full invariance model overestimated the decrease
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9 in leadership whereas it underestimated the decrease in vanity compared with the final partial
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11 invariance model that controls for non-invariance. This finding provides a cautionary tale for
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13 those who trust that measures will work similarly across time and use simple indicators such
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15 as internal consistency to evaluate whether measures are equivalent.
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18 **Ethnicity Matters in the Analysis of Generational Changes in Narcissism**

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20 We found that with respect to generational changes on narcissism, ethnicity matters.
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22 In our separate analyses for Asians and non-Asians, fewer items were non-invariant
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24 compared with the whole sample. This indicates that cross-ethnicity non-invariance may have
25
26 been confounded with cross-cohort non-invariance in our analyses of the whole sample.
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28 Results on mean differences also differed strongly between Asian and non-Asian subsamples
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30 as well as between Caucasian, Asian, and African American subsamples. Moreover, the
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32 findings were unexpected. Past arguments have been made that including Asian populations
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34 in cross-cohort analyses may dampen the putative increases in narcissism across cohorts. We
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36 found rather that the inclusion of Asian students in the samples may have dampened the
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38 evidence for decreases in narcissism in non-Asian populations across cohorts. In fact, Asian
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40 students showed an increase in vanity whereas non-Asians showed a decrease in vanity.
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42 Consistently across ethnic groups, decreases in leadership were found. This decrease was
43
44 strongest for African Americans. African Americans also showed stronger decreases in vanity
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46 between the 2000s and the 2010s compared with the other ethnic groups and the overall trend
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48 in the complete sample. Thus, taking ethnicity into account when investigating the
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50 measurement invariance of narcissism questionnaires across cohorts and generational
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Cohort differences in narcissism

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changes in narcissism is very important and clearly affects results (see also Twenge & Foster, 2008).

Limitations and Future Directions

This study was based on large student samples from different cohorts. Nevertheless, the data came from only three universities, and the data for the 1990s cohort came from a different university than the data for the 2000s and 2010s cohorts. A model comparing students from the University of Illinois at Urbana-Champaign and the University of California, Davis campuses found that Davis students on average scored lower than Illinois students on overall narcissism ($d = -0.29$, 95% CI $[-0.36, -0.22]$) as well as the leadership ($d = -0.33$, 95% CI $[-0.40, -0.26]$), vanity ($d = -0.16$, 95% CI $[-0.23, -0.09]$), and entitlement facets ($d = -0.26$, 95% CI $[-0.33, -0.19]$). Far less is known about potential changes in narcissism in non-student samples. Future research should test cohort differences in narcissism in non-student samples. The 1990s cohort was much smaller than the other two cohorts and this may be one reason why measurement non-invariance was mainly found with respect to the 1990s cohort. Our year-by-year analyses of the University of California, Davis and University of Illinois at Urbana-Champaign students indicated that among the 2000s and 2010s year groups, a number of NPI items also showed non-invariance.

The analyses were based on the NPI, a narcissism inventory with known psychometric problems (e.g., Ackerman et al., 2015; Ackerman et al., 2011; Wetzel et al., 2016). However, since most previous research on narcissism in social and personality psychology is based on the NPI (Cain, Pincus, & Ansell, 2008), we think it was important to test measurement invariance and cohort differences for this particular instrument, especially since arguments for the narcissism epidemic have largely been based on research using this measure. Nevertheless, it would be interesting to investigate whether the cohort differences found here can be confirmed when other narcissism questionnaires are studied. As our results show a

Cohort differences in narcissism

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3 decrease, rather than an increase, in narcissism, researchers may now need to explain this
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5 decline instead of speculating on why culture has led to an increase in narcissism.
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8 Generational changes have been investigated for a number of constructs including
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10 self-esteem (Twenge & Campbell, 2001), anxiety (Twenge, 2000), personality traits (Andre
11
12 et al., 2010), and psychological health (Stewart & Bernhardt, 2010). However, in most of
13
14 these cases the measurement invariance of the instruments across cohorts was not tested
15
16 (for an exception see Smits, Dolan, Vorst, Wicherts, & Timmerman, 2011). Considering the
17
18 implications of measurement non-invariance, future research on generational changes should
19
20 take measurement invariance across cohorts into account.
21

22 23 **Conclusion**

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25 In contrast to popular opinion, we did not find that today's college students are more
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27 narcissistic than college students in the 1990s or the 2000s, at least in the three universities
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29 examined in the present study. In fact, we found small decreases both in overall narcissism
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31 and in the leadership, vanity, and entitlement facets. Importantly, these decreases already
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33 started between the 1990s and the 2000s and only continued more strongly in the late 2000s
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35 and 2010s. Our study suggests that today's college students are less narcissistic than their
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37 predecessors and that there may never have been an epidemic of narcissism.
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