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Egos deflating with the Great Recession: A cross-temporal meta-analysis and within-campus analysis of the Narcissistic Personality Inventory, 1982–2016

Jean M. Twenge [a,*], Sara H. Konrath [b], A. Bell Cooper [c], Joshua D. Foster [d], W. Keith Campbell [e], Cooper McAllister [a]

[a] San Diego State University, United States of America
[b] Indiana University, United States of America
[c] Lynn University, United States of America
[d] University of South Alabama, United States of America
[e] University of Georgia, United States of America

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ABSTRACT

Scholars posit that economically prosperous times should produce higher individualism and narcissism, and economically challenging times lower individualism and narcissism. This creates the possibility that narcissism among U.S. college students, which increased between 1982 and 2009, may have declined after the Great Recession. Updating a cross-temporal meta-analysis of the Narcissistic Personality Inventory to 2013 ($k = 164$, $N = 35{,}095$) and adding two within-campus analyses to 2015 (Study 2: UC Davis, $N = 58{,}287$) and 2016 (Study 3: U South Alabama, $N = 14{,}319$) revealed a non-monotonic pattern, with increases in NPI scores between 1982 and 2008 and declines thereafter. The decline in NPI scores during and after the recession took narcissism back to their original levels in the 1980s and 1990s. Implications for the interplay between economic conditions and personality traits are discussed.

1. Introduction

Narcissism is a personality trait that involves having an inflated sense of self-esteem in combination with low empathy for other people (Miller & Campbell, 2008). Narcissistic people have difficulty in maintaining close relationships (Campbell & Foster, 2002; Paulhus, 1998) and become aggressive when they receive threats to their egos (Bushman & Baumeister, 1998; Konrath et al., 2006; Rasmussen, 2016).

In the current paper, we examine trends over the decades in narcissism in the U.S. and examine to what extent these trends changed after the Great Recession of 2007–2009. Cultural change over time in personality traits and other psychological attributes can be influenced by many factors, one of which is economic cycles (Santos et al., 2017). Economic cycles may have a particular influence on views of the self, including narcissism. For example, Greenfield's 2009 theory of social change and human development posits that economic hardship decreases individualism and increases collectivism. Consistent with this, communal behaviors and attitudes were higher during the years of the Great Recession compared to those immediately before in a nationally representative sample of high school students (Park et al., 2014). Given links between narcissism and high individualism and low communalism (Miller & Campbell, 2008), this suggests narcissism may decline during troubled economic times.

There are several specific reasons why troubled economies might be associated with lower narcissism. In good economic times, people may be confident enough of individual opportunities that they scale back on communal involvement. Essentially, they may believe that they do not need others to meet their needs. During times of economic crisis, however, it is more difficult to rely only on oneself. More limited opportunities may also make people more humble about what the future might hold, and narcissism may be tempered by the reality of setbacks and the need for interdependence in order to achieve one's goals. Indeed, research finds that people from higher socioeconomic backgrounds have higher narcissism (Piff, 2014).

Research addressing links between economic cycles and narcissism has focused primarily on unemployment rates, an indicator of troubled

* Corresponding author at: Department of Psychology, San Diego State University, 5500 Campanile Drive, San Diego, CA 92182-4611, United States of America.
E-mail address: jtwenge@mail.sdsu.edu (J.M. Twenge).

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economic times. For example, in several cross-sectional studies, higher unemployment rates during emerging adulthood predicted lower narcissism (Bianchi, 2014), particularly among men (Leckelt et al., 2016). Bianchi (2016) has also presented more recent cross-sectional data showing that individualism tracks economic cycles.

If there is, as suspected, a link between economic cycles and narcissism, this should appear among U.S. samples during the Great Recession, which began in December 2007 and ended in June 2009 (NBER, 2016). Even after 2009, the U.S. entered a period of slow growth that arguably existed until the mid-2010s (this has been termed the "muddle through economy" or "new normal," e.g., Worstall, 2016), with high unemployment through at least 2011 and underemployment persisting even later. Equity and housing markets rebounded, but job growth was sluggish and GDP growth hovered around 2% between 2010 and 2015 (World Bank, 2016).

Non-cyclical economic indicators such as income inequality may also be worth examining. For example, high status is associated with narcissism, especially when feelings of egalitarianism are low (Piff, 2014). That suggests income inequality might be linked to higher narcissism, especially among those with higher income. However, income inequality might undermine narcissism if it is linked to fewer employment opportunities (e.g., Bianchi, 2014).

In the present research, we examined trends in narcissism as measured by Narcissistic Personality Inventory (NPI) from 1982 to 2016. These data are meta-analytic (e.g., collected from existing sources as means and standard deviations) and time-lagged (e.g., made up of similarly aged samples drawn from different years), and not longitudinal (following the same people over the years). Thus, these data can identify birth cohort and time period shifts in narcissism as age is held constant.

If there is a link between economic cycles and ego inflation and deflation, we would expect narcissism scores to start decreasing around the time of the Great Recession and to be related to signs of economic downturn. To our knowledge, this is the first study using time-lag data to examine the effect of economic factors on narcissism concurrently (rather than measuring narcissism at one time in a sample varying in age; e.g., Bianchi, 2014). Before describing the current research in detail, we briefly review the literature on trends in narcissism over time.

1.1. Narcissism over time

A cross-temporal meta-analysis of 85 samples of U.S. college students between 1982 and 2006 found a linear trend toward higher NPI scores over this time period (Twenge et al., 2008). Other papers also found increases in narcissism over this time period in the U.S. (Stewart & Bernhardt, 2010), Korea (Lee et al., 2014), and Sweden (Billstedt et al., 2016), and traits related to narcissism, such as individualism and positive self-views, also increased (Grossmann & Varnum, 2015; Santos et al., 2017; Twenge & Campbell, 2009; Twenge, Campbell, & Gentile, 2012).

Subsequently, Trzesniewski et al. (2008) reported no changes in NPI scores when comparing college student samples from three University of California campuses between 1982 and 2007. However, the samples from different decades were also from different college campuses (UC Berkeley and UC Santa Cruz 1979–1984, UC Berkeley in 1996, and UC Davis 2002–2007), making it impossible to separate the effects of campus and year – a crucial issue as students at UC Davis scored significantly lower on the NPI than students at other campuses (Twenge & Foster, 2010). When the samples from UC Davis were examined in isolation, NPI scores increased between 2002 and 2007 (Twenge & Foster, 2008).

Roberts et al. (2010) then combined the UC campus data with the data from the Twenge et al. (2008) meta-analysis and reported that NPI scores did not change over time. However, two-thirds of the data in the 2000s was from UC Davis, again creating a significant confound between campus and year. When a control for campus was added to this data, the increase in NPI scores again appeared (Twenge & Foster, 2010). In addition, NPI scores increased between the 1990s and the 2000s among students on one campus, the University of South Alabama (USA; Twenge & Foster, 2010).

Wetzel et al. (2017) then reported that narcissism declined among American college students from 1992 to 2015. This paper included data from three separate university campuses over three different time spans (UC Berkeley 1992–1996; UC Davis 2002–2015; U Illinois Urbana-Champaign 2009–2012), again creating confounds between campus and year. Nevertheless, an examination of Wetzel et al.'s Fig. 2 suggests a non-monotonic curvilinear pattern with a rise in NPI scores before the Great Recession and a decline after; however, the paper does not include any analyses examining curvilinear effects.

In the current paper, we present three studies testing the hypothesis that narcissism rose before the Great Recession and declined afterward. We first update the previous cross-temporal meta-analysis by adding new samples since 2009, new data that have not been previously examined in a cross-temporal meta-analysis. Next, we re-examine Wetzel et al.'s (2017) data from UC Davis (2002 to 2015). Finally, we examine trends in narcissism at another campus, the University of South Alabama, 1994 to 2016. These three separate examinations should provide further evidence about trends in American college students' narcissism over time.

1.2. The current research

Our primary aim was to extend previous cross-temporal meta-analyses and two within-campus studies to explore trends in narcissistic personality traits during and after the Great Recession. To provide a consistent view of NPI scores across the time period, we used the same search methods and inclusion criteria as the original cross-temporal meta-analysis (Twenge et al., 2008) and its update (Twenge & Foster, 2010), focusing on U.S. college students who completed the 40-item forced-choice NPI. Next, we re-analyzed group-level data from UC Davis between 2002 and 2015, originally presented in Wetzel et al. (2017), to determine whether narcissism rose and then fell in the data from this campus. Finally, we examined samples from the University of South Alabama, a campus that showed significant increases in NPI scores between 1994 and 2009 in a previous analysis (Twenge & Foster, 2010).

These within-campus data avoid confounds between campus and year and provide data up to 2015 (UC Davis) and 2016 (U South Alabama), after the economic recovery was well underway. Given previous theory and literature on the effects of economic downturns on narcissism, we hypothesize that NPI scores will begin to decrease, likely beginning around 2008, and that college students' NPI scores will be higher when unemployment is lower. We also explore links with two other economic markers: Stock market indicators, which serve as a proxy for economic wealth and predicted corporate prosperity, and income inequality.

2. Study 1: Update of meta-analysis

Study 1 aimed to update the previous cross-temporal meta-analyses of the NPI, gathering mean scores on college student samples from the research literature and combining the data with that from the previous analyses.

2.1. Method

2.1.1. Literature search

Studies were located using the Web of Knowledge citation index, searching for articles published until the end of 2015. The Web of Knowledge is an extensive database, including virtually all journals in the social sciences, biological and physical sciences, and medicine. We searched the citation index for articles that cited one of the original sources of the NPI (Raskin & Hall, 1979; Raskin & Hall, 1981; Raskin &

Terry, 1988). Two unpublished samples from one author were also included. We did not solicit other unpublished datapoints.

2.1.2. Inclusion rules

Possible data points for the analysis were included or excluded on the basis of specific inclusion rules. To be included in the analysis, a study had to meet the following criteria, also used in the original Twenge et al. (2008) paper: a) participants were undergraduates at conventional four-year institutions (e.g., not two-year colleges, not military academies); b) participants were attending college in the United States; c) means were reported for unselected groups of students, not those chosen for scoring high or low on the NPI or another measure, or singled out for being maladjusted, clients at a counseling center, in a coupled relationship, etc.; d) samples were not more than 79% female or 79% male; and e) the study used the 40-item forced-choice version of the NPI.

When e-mail addresses could be located, we e-mailed the authors of published articles who used the NPI but did not report the mean and asked for it, along with year of data collection. When the exact year of data collection was not available, year of data collection was coded as two years prior to publication, as in previous meta-analyses (e.g., Oliver & Hyde, 1993).

This new literature search yielded 75 samples of 18,582 college students collected between 2007 and 2013. Combined with the data from Twenge and Foster (2010), this totaled to 183 samples of 68,722 college students (60.2% female). However, when we excluded data from UC Davis and the University of South Alabama included in the single-campus analyses (Studies 2 and 3), this new meta-analysis consisted of 164 samples, with 35,095 college students, from 1982 to 2013 (59.5% female).

2.1.3. Data analysis

In order to determine whether there were different patterns before (1982–2008) and after (2009–2013) the Great Recession, we first mean centered year and then created a dummy code for the recession variable (0 = pre-recession, 1 = post-recession). Next, we computed the interaction term by multiplying year by the recession dummy. In the regression, we weighted by the sample size of each study to provide better estimates of the population mean.

We examined trends in NPI scores over time by regressing the year of data collection onto NPI means. In Step 1 of the regression analysis, we included year and the recession dummy, and in Step 2, we included the interaction term. Standardized betas are presented. We also examine regressions within each time period, known as the two lines method (Simonsohn, 2018).

To calculate the magnitude of change in NPI scores, we used the regression equations and the averaged standard deviation (SD) of the individual samples. To compute the mean scores for specific years (e.g., 1982 or 2008), we used the regression equation from the statistical output (Twenge et al., 2004). We obtained the mean standard deviation (SD) by averaging the within-sample SDs reported in the data sources, weighted by sample size. This reflects the average variance of the measure in a sample of individuals rather than the smaller variance among group-level means. For example, the variation in exam grades among the individuals in one class will be larger than the variation in means between the classes. Using the individual-level SD here means the effect size is relevant for individuals and avoids the ecological fallacy (for a full discussion of this issue, see Twenge & Campbell, 2010).

We obtained the yearly unemployment rate, the employment/population (EP) ratio for 20 to 24-year-olds (the percentage in the age group who held paying jobs), the Gini index of income inequality, and yearly change in the Dow Jones Industrial Average (DJIA) from the Bureau of Labor Statistics, the World Bank, and Dow Jones sites. We then examined the correlation between these indicators and NPI scores, entering (for example) the unemployment rate for the year of the NPI score was obtained.

2.2. Results and discussion

NPI scores appeared to increase before the Great Recession and decline afterward (see Fig. 1). We tested this in a regression model. In Step 1, both year ($\beta = 0.32$, $p = .002$) and recession ($\beta = -0.34$, $p = .001$) significantly predicted mean NPI scores. In Step 2, although year remains significant ($\beta = 0.38$, $p < .001$), recession is now marginally significant ($\beta = 0.50$, $p = .06$). There is the predicted interaction between year and recession ($\beta = -0.92$, $p = .001$). In order to better understand this interaction, we next split the file by the recession dummy, and ran separate regressions within each time period (Simonsohn, 2018). As predicted, from 1982 to 2008, there was a significant rise in narcissism, $\beta = 0.38$, $p < .001$, $d = 0.24$, and from 2009 to 2013, there was a significant decline in narcissism, $\beta = -0.30$, $p = .038$, $d = 0.16$.

We next examined whether narcissism was linked to economic indicators (see Table 1). These analyses found that narcissism was higher when unemployment was lower. Correlations with other economic indicators were not significant.

Thus, in the updated cross-temporal meta-analysis, we found that narcissism rose between 1982 and 2008, and then declined from 2009 to 2013. Given the timing, this suggests that the Great Recession may have affected narcissistic personality traits. This possibility was strengthened by the finding that narcissism was higher when unemployment was lower. However, the trend lines and the links with unemployment would need to be replicated in the next two studies in order to increase confidence in the results.

3. Study 2: Within-campus analysis, UC Davis 2002–2015

Examining data within one campus eliminates any possible confounds of data being collected at different campuses in different years, and allows the elimination of variance by campus. Thus, we now present the results of two separate within campus analyses. Study 2 examines data from University of California, Davis, between 2002 and 2015, and Study 3 presents data from University of South Alabama from 1994 to 2016.

3.1. Method

UC Davis data were available from 2002 to 2015 ($n = 58{,}287$) and provided by Dr. Wetzel. Specifically, we received information on the year, sample size per year, means and standard deviations of the NPI-40 each year. To determine whether there were different patterns before (2002–2008) and after (2009–2015), we first mean centered year and then created a dummy code for the recession variable (0 = pre-recession, 1 = post-recession). Next, we computed the interaction term by multiplying year by the recession dummy. In the regression, we weighted by the sample size of each study to provide better estimates of the population mean. We examined changes in NPI scores over time by regressing the year of data collection with NPI means. In Step 1 of the regression analysis, we included year and the recession dummy, and in Step 2, we included the interaction term.

3.2. Results and discussion

As Fig. 2 shows, NPI scores at UC Davis rose before the Great Recession and declined afterward. We confirmed this pattern with a regression. In Step 1, neither year ($\beta = -0.59$, $p = .17$) nor recession ($\beta = -0.19$, $p = .64$) significantly predicted mean NPI scores. In Step 2, year becomes a significant predictor of narcissism ($\beta = 0.79$, $p = .01$) and recession is marginally significant ($\beta = -0.37$, $p = .059$), and there is the predicted interaction between year and recession ($\beta = -1.37$, $p < .001$). We next ran separate regressions within each time period. As predicted, from 2002 to 2008, there was a significant rise in narcissism, $\beta = 0.92$, $p = .003$, and from 2009 to 2015, there was a significant decline, $\beta = -0.93$, $p = .002$.

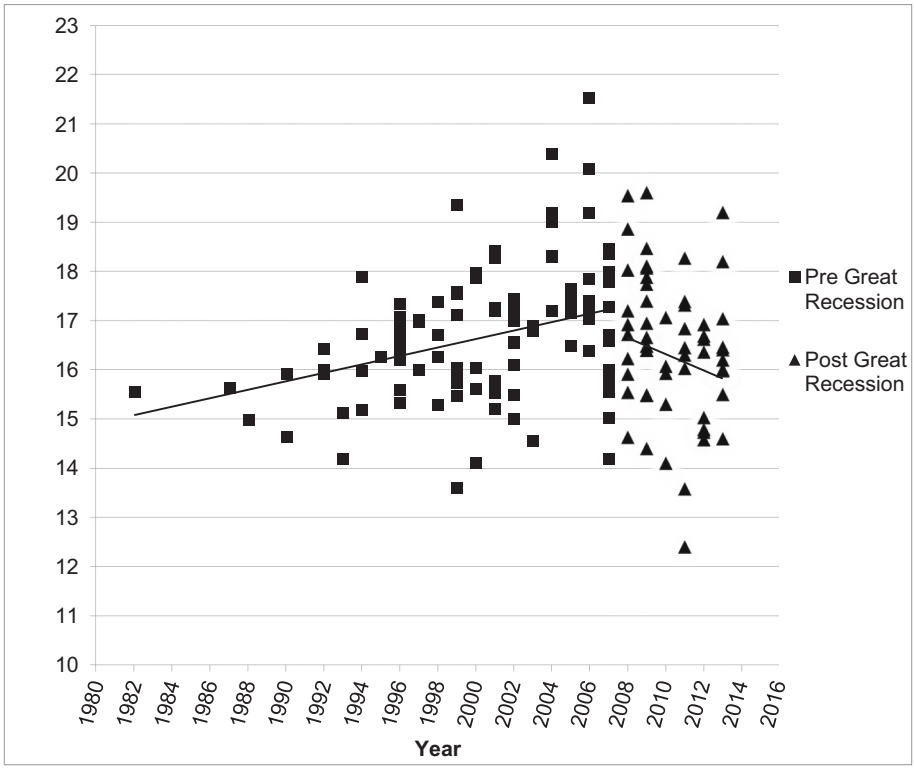

Fig. 1. Scatter plot and linear trends, NPI scores of U.S. college students, 1982–2013 (Study 1).

Table 1
Means, standard deviations, and correlations between variables, Study 1, cross-temporal meta-analysis update, 1982–2013.

	Mean (SD)	Year	Unemployment	EP ratio	DJIA change	Gini
Year	2004.12 (6.42)	–	.45***	−.77***	−.08	.91***
Unemployment	6.17 (1.78)	.45***	–	−.89***	.14~	.29***
EP ratio	67.08 (3.86)	−.77***	−.89***	–	−.14~	−.62***
DJIA change	8.33 (16.26)	−.08	.14~	−.14~	–	.03
Gini	.4643 (.0114)	.91***	.29***	−.62***	.03	–
NPI	16.55 (6.86)	.09	−.17* (−.21**)	.13~ (.34**)	−.08 (−.07)	.13 (.33)

Note. Regression coefficients with NPI means are weighted by n. ~$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. Numbers in parentheses are controlled for year.

We again examined whether narcissism was linked to economic indicators (see Table 2). These analyses revealed a positive correlation between narcissism and the employment to population ratio among youth, meaning that narcissism was higher when unemployment was lower and more young people were working (higher EP ratio). In addition, the negative correlation between NPI scores and the Gini indicates that narcissism was lower during times of higher inequality. Examining the data from 1994 to 2013 to be more similar to the cross-temporal meta-analysis does not change these conclusions (see Table 2).

One strength of this analysis is that it relies on data from a single college campus over time, thus holding constant the variation that occurs when conducting a cross-temporal meta-analysis using any available data. However, it still relies on group-level data only, which may obscure smaller, individual-level patterns. Hence, in Study 3 we examine our research question in a separate within-campus analysis that covers an even broader time span—examining the results at both the mean/aggregate level and at the individual level.

4. Study 3: Within-campus analysis, U South Alabama 1994–2016

We obtained data from the University of South Alabama, where data was available from a 1994 sample and then every year between 2006 and 2016.

4.1. Method

One hundred nineteen undergraduates at South Alabama completed the NPI as part of a study on narcissism and causal attributions in 1994 (Ladd et al., 1997); these data are only available as a mean and standard deviation (group level), with the individual level data unavailable. Individual-level NPI data from South Alabama were available for each semester between Spring 2006 and Fall 2016, $N = 14{,}200$. These data were not included in Study 1. These data must be analyzed at the group level to include the 1994 data. As more information was available on these participants, we were also able to examine the more homogeneous group of 18- to 22-year-old Americans, further reducing the possibility of confounding.

We again mean centered year, created a recession dummy variable

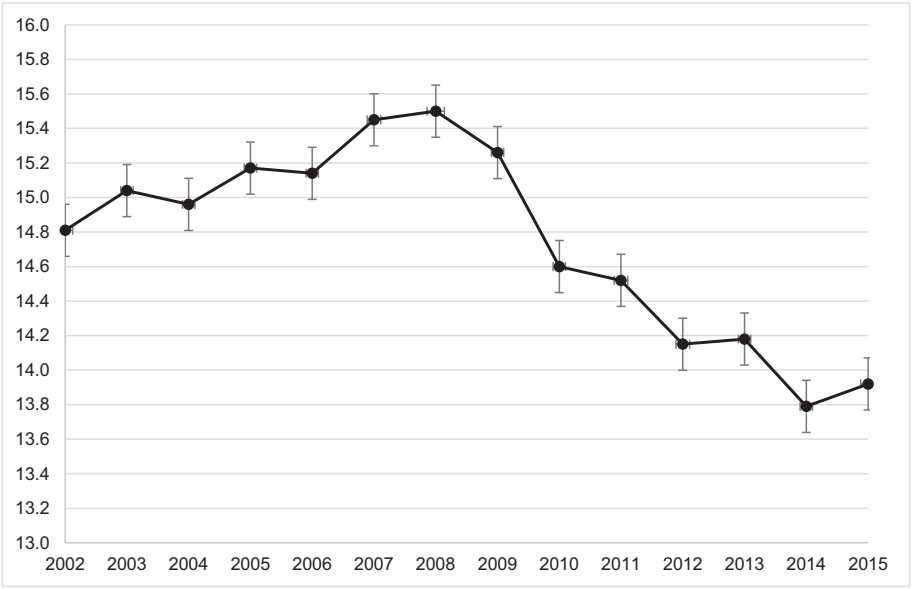

Fig. 2. Mean NPI scores over time for students attending UC Davis, 2002–2015 (Study 2). Capped vertical bars denote ±1 *SE*.

Table 2
Means, standard deviations, and correlations between variables in Study 2, UC Davis, 2002–2015.

	Mean (SD)	Year	Unemployment	EP ratio	DJIA change	Gini
Year	2008.5 (4.18)	–	.33	−.81***	.17	.89***
Unemployment	6.52 (1.78)	.33	–	−.80***	.29	.26
EP ratio	65.05 (3.44)	−.81***	−.80***	–	−.35	−.73**
DJIA change	5.43 (15.91)	.17	.29	−.35	–	.31
Gini	.4709 (.0068)	.89***	.26	−.73**	.31	–
NPI means, 2002–2015	14.75 (6.87)	−.76**	−.18 (.10)	.60* (−.05)	−.14 (−.03)	−.85*** (−.84*)
NPI means, 2002–2013	14.90 (6.88)	−.62*	−.51 ~ (−.16)	.65* (.45)	−.28 (−.13)	−.80** (−.97*)

Notes: 1. Regression coefficients with NPI means are weighted by *n*. 2. ~$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. 3. Numbers in parentheses are controlled for year. 4. EP ratio = Employment to population ratio. DJIA = Dow Jones Industrial Average. NPI = Narcissistic Personality Inventory.

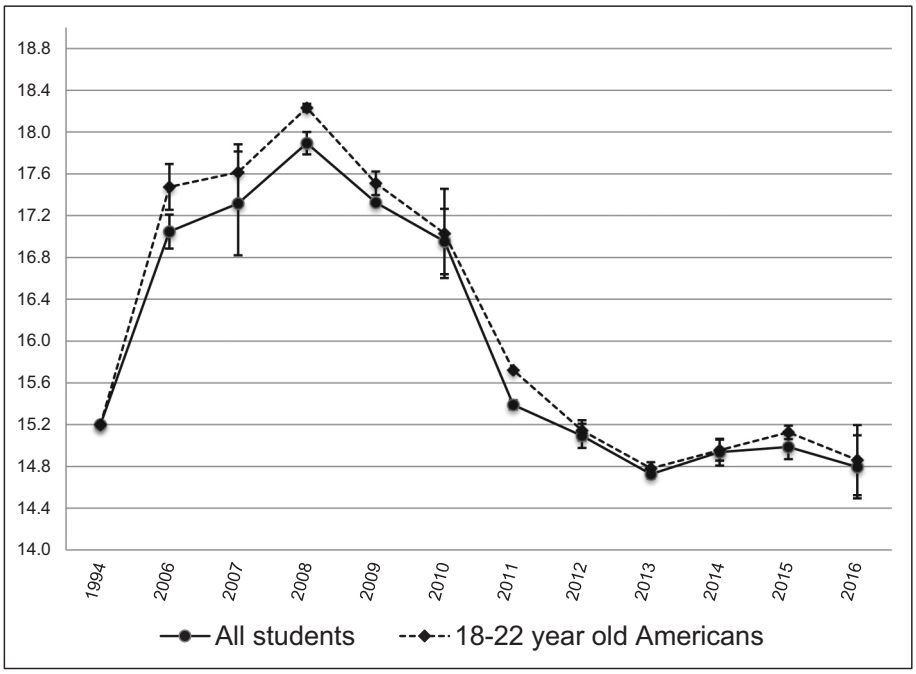

Fig. 3. Mean NPI scores by year, University of South Alabama students, 1994–2016 (Study 3). Capped vertical bars denote ±1 *SE*.

(0 = pre-recession, 1 = post-recession), and computed their interaction term. In Step 1 of the regression, year and recession dummy were entered into the analysis, and in Step 2, the interaction term was entered, to predict mean narcissism scores. Regressions are weighted for sample size, and standardized betas are presented.

4.2. Results and discussion

As Fig. 3 shows, NPI scores among South Alabama students increased before the Great Recession and then declined, both in the entire sample and among 18- to 22-year-old American students. We then performed a regression analysis to verify these results. In Step 1, the recession variable ($\beta = -0.21$, $p = .35$) did not significantly predict mean NPI scores, but there was a significant overall decline during this time period ($\beta = -0.58$, $p = .02$). In Step 2, year became marginally significant ($\beta = 0.56$, $p = .069$) and recession became significant ($\beta = -0.63$, $p = .002$). There was the predicted interaction between year and recession ($\beta = -1.01$, $p < .001$). This again suggests that the slopes before and after the recession were significantly different.

Next, we ran separate regressions within each time period. For the pre-recession years (1994–2008), NPI scores increased, though the effect was marginally significant (likely due to only including 4 years of data, $k = 7$), $r = 0.73$, $p = .06$, whereas for the post-recession years (2009–2015), NPI scores decreased significantly, $r = -0.82$, $p < .001$.

In the previous analysis of South Alabama data (Twenge & Foster, 2010), the NPI subscales vanity, self-sufficiency, and superiority increased the most 2006–2009. We thus next used the same analysis to determine which subscales were changing the most between 2006 and 2016. (Note that 1994 subscale scores are unavailable.) As can be seen in Table 3, the interaction term between year and recession was significant for authority, self-sufficiency, superiority, and vanity, and was marginally significant for exhibitionism. The interaction was non-significant for exploitativeness and entitlement. Overall, the patterns suggest marginal increases in authority, self-sufficiency, and vanity in the three years when data was available before the recession (from 2006 to 2008). However, there were significant declines in authority, self-sufficiency, superiority, and exhibitionism between 2009 and 2016, and marginal declines in vanity. The results suggest no significant changes over time in exploitativeness or entitlement.

Cyclical economic indicators were not significantly correlated with NPI scores 1994–2016, but NPI scores were again higher when income inequality was lower. In addition, when the data are examined 1994–2013 to be more similar to the cross-temporal meta-analysis, NPI scores were positively correlated with the EP ratio in the mean-level data (see Table 4). Thus, similar to the cross-temporal meta-analysis, NPI scores were higher when more young people were working.

Table 3
NPI subscales, Study 3, University of South Alabama, 1994–2016.

	Year	Recession	Interaction	PreRecess	PostRecess
				1994–2008	2009–2016
Authority	2.30*	−1.35**	−2.29**	.80~	−.79***
Self sufficiency	1.50	−.77	−1.75*	.75~	−.69**
Superiority	.77	−.75~	−1.20*	.67	−.81***
Vanity	4.09**	−1.76*	−3.26**	.75~	−.47~
Exhibitionism	.33	−.66*	−.83~	.24	−.87***
Exploitative	.01	−.47	−.51	–	–
Entitlement	.35	−.58	−.89	–	–

Note. Results presented are standardized betas from Step 2 of regression. Results for pre versus post-recession are only presented when the interaction term was at least marginally significant.
~ $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

5. General discussion

Across three separate studies, we identified a non-monotonic trend in narcissism scores over time, with scores increasing until the Great Recession and then decreasing during and after it. Consistent with previous research (Stewart & Bernhardt, 2010; Twenge et al., 2008; Twenge & Foster, 2008, 2010, cf. Grijalva et al., 2015), narcissism increased among college students between 1982 and the late 2000s. Then, around the beginning of the Great Recession, narcissism scores began to falter, by 2013–2016 falling to the levels of the 1980s/1990s. This pattern appeared in both a nationwide cross-temporal meta-analysis of college student samples (Study 1) and within-campus analyses of students from University of California, Davis (Study 2) and the University of South Alabama (Study 3). In some analyses, years with higher unemployment and fewer young people participating in the workforce had lower narcissism scores. Thus, the Great Recession may have acted as a reset for the steady rise in narcissism between the 1980s and the 2000s.

These results are consistent with theoretical models that tie narcissism and related constructs (e.g., higher individualism, lower communalism) to economic growth and decline, especially employment (e.g., Bianchi, 2014, 2016; Greenfield, 2009; Park et al., 2014). It is also consistent with models that link higher socioeconomic status to higher narcissism and related variables (e.g., entitlement, antagonism; Piff, 2014; Piff et al., 2012).

Although we have explored economic factors as a potential cause of trends in narcissism, other causes are also possible. For example, narcissism began to decline when the nation elected its first African-American president, Barack Obama, who regularly spoke about the importance of empathy. In addition, the increasing popularity of social media may have played a role. In the years before 2010 when social media was less popular, these sites may have encouraged narcissism as they were an effective way to gain attention and followers (Liu & Baumeister, 2016; McCain & Campbell, 2018). Once social media became used by the vast majority of traditional-age college students after 2012, however, happiness and self-esteem – traits positively correlated with grandiose narcissism in young populations (Sedikides et al., 2004) – began to decline (Twenge et al., 2018), perhaps because social media leads to unflattering upward social comparison (Steers et al., 2014). The possible suppressive effects of social media on narcissism may be one reason why narcissism scores leveled off in Study 3 after 2013 and why economic factors were better predictors in analyses up to 2013 compared to those up to 2016. This suggests that other factors were lowering NPI scores after 2013. Research should continue to explore links between social media, narcissism, and poor psychological well-being.

The time-lag design of this study holds age relatively constant. Thus, age (i.e., being younger versus older) is unlikely to explain the results; not only would age have to differ systematically with year, but it would have to follow the same non-monotonic trend as narcissism to explain the results. However, this design cannot determine whether the shifts are due to cohort effects (which only affect young people) or time period effects (which affect people of all ages). If this is a cohort effect, early Millennials (those born between 1980 and 1988) reached all-time highs for narcissism and remained that way, while late Millennials (those born between 1989 and 1994) returned narcissism to the levels of the late Boomers (those born in the early 1960s) and will remain that way. If this is a time period effect, it would suggest that the narcissism of all generations deflated during and after the Great Recession.

As found in previous research, the change over time in narcissism is moderate at the average (around a third of a standard deviation), similar to many effects in social psychology (Richard et al., 2003). However, the effects are larger at the ends of the distribution. In 1982, about 19% of college students answered the majority of the NPI items in the narcissistic direction; by 2009 this was 30%, a 58% increase (Twenge & Foster, 2010). By 2013, it was back to around 19%, a 37% decrease. These changes are thus large enough to be noticeable, particularly if those

Table 4
Means, standard deviations, and correlations between variables, Study 3, University of Southern Alabama, 1994–2016.

	Mean (SD)	Year	Unemployed	EP ratio	DJIA change	Gini
Year	2010.26 (4.75)	–	.02	−.60**	.02	.87***
Unemployment	6.68 (1.90)	.02	–	−.78***	.26	.15
EP ratio	64.02 (3.05)	−.60**	−.78***	–	−.34	−.57**
DJIA change	7.01 (14.70)	.02	.26	−.34	–	.31
Gini index	.4724 (.0073)	.87***	.15	−.57**	.31	–
NPI means, 1994–2016	16.02 (6.96)	−.73***	.09	.40~	−.33 (−.26~)	−.88***
			(.05)	(.09)		(−1.09***)
NPI means, 1994–2013	16.41	−.59*	−.28	.52*	−.45~ (−.34)	−.85***
	(7.10)		(.06)	(.15)		(−1.14***)

Notes: 1. Regression coefficients with NPI means are weighted by *n*. 2. ~$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$. 3. Numbers in parentheses are controlled for year. 4. EP ratio = Employment to population ratio. DJIA = Dow Jones Industrial Average. NPI = Narcissistic Personality Inventory.

scoring 20 or higher on narcissism cause issues in the classroom or workplace (Campbell et al., 2015).

5.1. Limitations and future research

This research is limited in several ways. First, the method of cross-temporal meta-analysis is limited to the available data. The samples taken each year are not random. Optimally, they are random with respect to the association of interest (i.e., narcissism and time) but that is not guaranteed. We partially remedied this by also examining samples from the same college campus in Studies 2 and 3. Ideally, future research will explore changes over time in other individual difference data sets that are differently constructed, include variables related to narcissism such as better-than-average ratings or values, and include relevant cultural products (e.g. song lyrics). Also, all three of these studies were limited to college students, who are a growing but select portion of young Americans. The conclusions are also limited to the U.S.; it is unknown if the downward trend in narcissism after 2008 also appeared in other countries.

Second, there is not an optimal economic measure to use in this research. We used the unemployment rate and the employment to population ratio because they have a long history of use and are linked directly to individuals' economic experience. The unemployment rate may not have a direct or immediate effect on college students via their job prospects, but may influence them through their parents' employment experiences and their sense of their own economic prospects in the future. Other measures of economic activity such as GDP may be less directly related to individuals psychologically, and price inflation/deflation is challenging to measure cleanly. For example, the consumer price index (CPI) often obscures the sources of inflation that dominate people's thinking on a day-to-day basis (e.g., education, housing prices, and medical care). Overall, there is a need for more sophisticated economic models and data in terms of psychological processes.

5.2. Conclusion

In three different studies, narcissism scores rose until the Great Recession (around 2008) and then fell. These findings are consistent with the idea that self-processes and economic processes are linked in a meaningful way. Future research should expand the scope of this investigation and ideally develop more sophisticated markers of the economy relevant for psychological traits.

CRediT authorship contribution statement

J.M.T. helped develop the study concept and wrote part of the manuscript.

S. H. K. wrote part of the manuscript.

B. C. performed data analysis and provided crucial revisions.

J.D.F. curated data and provided crucial revisions.

W. K. C. wrote part of the manuscript and provided crucial revisions.

C. M. provided statistical consulting and crucial revisions.

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2021.110947.

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