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„Time Trends in Narcissism: A Cross-Temporal Meta-Analysis“

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Abstract

Positive time trends in narcissism have been shown among students in the USA. However, the debate about a rise in narcissistic tendencies is controversial. Time trends in narcissism with data outside the USA are scarce, and recent findings suggest a decline in narcissism since the Global Financial Crisis (GFC) in 2008. This study examined time trends in narcissism in a worldwide and comprehensive way. Time trends in narcissism were analyzed for North America (USA), Europe (German-speaking region), Asia, and Australia. The time trends in narcissism were analyzed using a Cross-Temporal Meta-Analysis. First, the mean scores of the widely used Narcissistic Personality Inventory (NPI) were analyzed in terms of a trend in the period from 1982 to 2020. Second, analyses were conducted for the period before the peak of the GFC in 2008 and afterward, to address the question of a reversal of trends in narcissism due to the GFC. Third, time trends in narcissism were analyzed as a function of sex. In summary, no positive trend was found in the USA among students. Meaningful decreases in narcissistic tendencies were evident in a worldwide analysis and in several regional analyses (North America, Europe, and German-speaking regions). The GFC showed to be insufficient in explaining changes in the pattern of time trends in narcissism. Unexpectedly, the findings of this study indicated that narcissistic tendencies among women significantly decreased over time, while the tendencies of men did not change over time. Several causes are discussed in relation to decreases in narcissistic tendencies.

Keywords: Narcissism, Narcissistic Personality Inventory, Time Trends, Cross-Temporal Meta-Analysis

Time Trends in Narcissism: A Cross-Temporal Meta-Analyses

As society changes over time, so do our cultural values and our developmental pathways (Greenfield, 2009). Within the last 20 years, studies in personality psychology have increasingly shown temporal changes in personality traits across generations in the general population (e.g. Curran & Hill, 2019; Hamamura et al., 2020; Konrath et al., 2011; Twenge & Campbell, 2001). In particular, a study that found an excessive positive time trend in the personality dimension of narcissism (Twenge et al., 2008) has been widely cited with 1448 citations on Google Scholar (13.06.2022) and controversially discussed in the scientific community (e.g. Arnett, 2013; Trzesniewski & Donnellan, 2010; Twenge, 2013). People with a narcissistic personality are characterized by an inflated self-view, a sense of entitlement, and a lack of empathy for others (Campbell & Foster, 2007). Using the methodology of a cross-temporal meta-analysis (CTMA), the study showed an increase in mean scores of the Narcissistic Personality Inventory (NPI) among students from the USA in the period between 1982 and 2006 based on 85 independent samples. In simplified terms, a CTMA is a correlation between the mean scores of a psychological construct and the year of data collection to analyze a time trend.

Together with findings from other studies (e.g. Gentile et al., 2010; Smits et al., 2011; Twenge & Campbell, 2001), a debate on a new "Generation Me" emerged. This debate revolves around the idea of a self-absorbed, egoistic, and narcissistic generation of young adults (Twenge, 2013). Studies put the rise of the individualization of our society in the spotlight (Bianchi, 2016; Greenfield, 2016; Grossmann & Varnum, 2015). Other studies showed increases in self-esteem (Gentile et al., 2010; Twenge & Campbell, 2001), decreases in empathy (Konrath et al., 2011), and decreases in trust in the community and religious institutions (Twenge et al., 2014). Twenge et al. (2008) postulated that Millennials in particular are more narcissistic due to cultural shifts toward individualism and selfishness. Millennials are roughly defined as the cohorts born between 1981 and 1996 (Dimock, 2019). This debate has also been taken up by the popular science media (e.g. Stein, 2013; Twenge & Campbell, 2009), indicating the scope of the debate. As described by Hamamura et al. (2020), the positive trend in trait narcissism can be attributed to various factors. One explanatory model for the rise of narcissism is the development of today's society on a macro level. Society has evolved from a rural, low-tech community with a subsidiary economy and lifelong dependent relationships to an urban, high-tech, school-educated society with a commoditized economy and short-term independent social contacts (Greenfield, 2009). In this individualized independent society, narcissistic tendencies are amplified and offer advantages, with the rise of narcissism seen as a symptom

of an individualistic society (Greenfield, 2016). The rise of the personality trait of narcissism is attributed to cultural changes in parenting, education, and media, which emphasize the self-esteem and individuality of children and young adults (Twenge, 2013). In particular, the rise of social media has been associated with the rise of narcissism (Twenge & Campbell, 2009). A meta-analysis found small to moderate effects regarding the association between social networking behavior and narcissism (McCain & Campbell, 2018).

Another explanation for a positive time trend in the narcissistic personality of students is that the narcissistic tendencies of women have become more like those of men over time. On average, women have less pronounced narcissistic tendencies than men (Grijalva et al., 2015). In a single-sex analysis of samples of women and men from the USA, it was shown that the mean NPI scores of women samples were subject to a positive trend, while men samples did not show a positive trend (Twenge et al., 2008). According to the study, the mean difference between the average scores of women and men in 1992 was significantly larger than the difference in 2006. These results are in line with analyses showing a more pronounced increase in agentic traits and assertiveness for women compared to men (Twenge, 1997, 2001). However, a convergence of narcissistic tendencies between the sexes has not been clearly established. A meta-analysis between 1990 and 2013 showed no convergence of narcissistic tendencies between the sexes (Grijalva et al., 2015) and a recent study was unable to establish any convergence in the facet of entitlement (Stronge et al., 2018).

The debate about an increase in narcissism has been widely held in the scientific community and popular literature (e.g. Donnellan et al., 2009; Stein, 2013; Trzesniewski & Donnellan, 2010; Twenge & Campbell, 2009). A stereotype of a young narcissistic generation has been established. A recent study showed that students believe that their age group and the following age group are the most narcissistic (Grubbs et al., 2019). However, research concerning an increase in narcissistic tendencies over time has several gaps. First, the findings of a positive trend in narcissism in the USA are conflicting and ambiguous. A representative study of schoolchildren from the USA did not find increases in egoism, individualism, or self-esteem over time (Trzesniewski & Donnellan, 2010). In studies analyzing an increase in narcissism in student samples from the USA, several findings showed no positive time trend in narcissism (e.g. Donnellan et al., 2009; Wetzel et al., 2017). The ambivalence of the findings regarding a trend in narcissism in the USA is well established in the discussion by Grubbs and Riley (2018). Because of this ambivalence in the results regarding time trends in narcissism in the USA, the question arises whether a positive trend of narcissism can be found in the USA. In addition to the ambivalence of the results within the USA, the studies exclusively examined

students and schoolchildren (e.g. Trzesniewski & Donnellan, 2010; Twenge et al., 2008), which is why time trends of narcissism cannot be generalized to the general population of the USA.

Second, studies investigating time trends in narcissism have been mainly using data from the USA. The few findings analyzing data from outside the USA did not find a positive trend in self-esteem over time in China (Liu & Xin, 2015) and Japan (Oshio et al., 2014). In New Zealand, no positive time trend was shown for entitlement, a facet of narcissism (Stronge et al., 2018). Most importantly, a study including Australian and Canadian samples found evidence of decreases in narcissism over time (Hamamura et al., 2020). These findings raise the question of whether a positive trend in narcissism is limited to the USA or can be generalized as a global trend.

Third, there has been a recent debate about a reversal in time trends of narcissism since the height of the Global Financial Crisis (GFC) in 2008. A study showed that the mean scores of the NPI, collected in Canada and Australia, were lower after 2008 than in the years before (Hamamura et al., 2020). Twenge et al. (2021) came to the same conclusion in their recent study, limiting the previously established positive trend in narcissism to the period up to 2008 and showing a significant negative trend since then. These time trend analyses are based on the results of a study that showed that entering adulthood during a financial recession reduces the likelihood of developing a narcissistic personality (Bianchi, 2014). The association has so far only been established in one study in the USA and could only be partially replicated in another study for samples from the USA and a sample from Germany (Leckelt et al., 2016). Accordingly, the timing of a reversal in the time trend of narcissism, namely the peak of the GFC in 2008/2009 (Hamamura et al., 2020; Twenge et al., 2021), emerged from an insufficiently studied correlation between financially difficult times and narcissism, which does not allow for causal conclusions. This justification remains insufficient and rather arbitrary to adequately explain a reversal of the time trend in narcissism.

In consideration of the current findings, it seems important to conduct a comprehensive and worldwide analysis of time trends in narcissism. Only a few time trends of narcissism have been examined outside the USA. To the author's knowledge, no CTMA has been conducted to analyze time trends in narcissism in Europe. Due to inconclusive findings of time trends in narcissism in the USA a comprehensive re-assessment of the data is needed. Recent findings of a reversal of time trends in narcissism, due to consequences of the GFC, need to be re-examined. The timing of a possible reversal of the time trend must be empirically investigated based on the data. Finally, it should be examined whether a positive time trend in narcissism can be attributed to the findings that the narcissistic tendencies of women have become closer to those

of men over time. This study used the method of a CTMA to conduct worldwide and regional time trends in narcissism in the general population in the period from 1982 to 2020. To the author's knowledge, this analysis represents the most comprehensive analysis to date of time trends in narcissism.

Narcissism

The concept of narcissism goes back to Greek mythology. The Greek saga is about the beautiful adolescent Narcissus who falls in love with himself because of a curse (for a more detailed description of the saga see for example Bulfinch, 1913). Narcissism found its way into psychology with the psychoanalyst Sigmund Freud. In his book “On Narcissism: An Introduction”, originally published in 1914, he describes people with narcissistic tendencies as being more self-attached than other-attached, and that social interaction is used to feel affirmed in one's self (Freud, 2014). Narcissism as a clinical disorder was first included in the Diagnostic and Statistical Manual, 3rd edition (DSM-III), in 1980 as Narcissistic Personality Disorder (NPD; APA, 1980). This inclusion in clinical classifications is mainly due to the work of the psychoanalysts Kernberg (1985) and Kohut (1971). From a psychoanalytical point of view, they explained, briefly summarized, a narcissistic disorder as a consequence of a defensive reaction against neglect (Kernberg, 1985) or the lack of so-called childhood mirroring, which describes the process in which parents report the positive self-image of the child back to the child (Kohut, 1971). In the Diagnostic and Statistical Manual, 4th edition and text revised, NPD is described as a "pervasive pattern of grandiosity (in fantasy or behavior), need for admiration, and lack of empathy, beginning by early adulthood and present in a variety of contexts" (APA, 2000, p. 714). A systematic review found a weighted prevalence of 0.26 % in the general population (Dhawan et al., 2010). However, a study for the USA showed a much higher prevalence of more than six percent (Stinson et al., 2008). The large differences are attributed to the lack of screening instruments and the absence of NPD in classification systems such as the International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10), and ICD-11 (Freestone et al., 2022). Due to the low prevalence and the non-inclusion in classification systems such as ICD-10 and ICD-11, the relevance of narcissism as a clinical disorder is questioned in the field of clinical psychology (Freestone et al., 2022). This position is particularly interesting when contrasted with publications in personality psychology, which have predicted cultural consequences due to an increase in the personality dimension of narcissism (e.g. Twenge & Campbell, 2009).

This study focuses on the personality trait of narcissism and not on the clinical disorder of NPD. This distinction should be kept in mind and considered when interpreting the analyses.

It is important to note that trait narcissism is regarded as a subclinical dimension of personality. Personality traits influence human experience and behavior. They are characteristics that remain relatively stable over time, they are not directly observable and are transsituational (Brinkmann, 2021). The assessment of trait narcissism is primarily used in empirical personality psychology. Subclinical personality questionnaires of narcissism serve the goal of examining narcissistic tendencies in the general population. Accordingly, rather socially malevolent personality facets can be examined. People with pronounced narcissistic tendencies are referred to as "disagreeable extraverts" (Paulhus, 2001) who are characterized by inflated self-views, feelings of entitlement, and lack of regard for others (Campbell & Foster, 2007). The personality trait of narcissism belongs to the *Dark Triad* (Paulhus & Williams, 2002) and is associated with a wide variety of behaviors and personality traits (Foster & Twenge, 2010). The *Dark Triad* refers to three personality dimensions characterized as aversive, explicitly, Machiavellianism, subclinical psychopathy, and subclinical narcissism (Paulhus & Williams, 2002). Because of the considerable empirical attention paid to trait narcissism and different perspectives that have been investigated, trait narcissism has been further differentiated and various questionnaires have been designed over time (e.g. Back et al., 2013; Hendin & Cheek, 1997; Jones & Paulhus, 2014). On an individual level, a broad distinction is made between vulnerable and grandiose narcissism. Vulnerable narcissism is characterized by introversion, worry, and defensiveness and was not examined in this study. Grandiose narcissism is associated with traits such as extraversion, dominance, and manipulability. This facet of trait narcissism was considered in this study and examined in terms of trends over time. A detailed differentiation of different constructs of narcissism can be found in Sedikides (2021). In the following, the term narcissism is used in the sense of the personality trait of grandiose narcissism.

In the work of Konrath (2007), different correlates of narcissism are discussed in detail. As indicated by Paulhus' quote (2001), studies have shown that narcissistic tendencies are associated with high scores in extraversion and low scores in agreeableness (Emmons, 1984). Other studies have shown that narcissism is associated with daily and dispositional well-being, as well as with lower levels of anxiety and depression (e.g. Raskin & Novacek, 1989; Sedikides et al., 2004). Concurrently, previous studies have shown a positive correlation between self-esteem and narcissistic tendencies (Ackerman et al., 2011). In terms of more maladaptive traits, narcissism has been associated with impulsivity (e.g. Jones & Paulhus, 2011; Malesza & Kaczmarek, 2018), lack of empathy (Watson et al., 1984), and high scores of entitlement (Campbell et al., 2004). Furthermore, associations between anger, hostility, and aggression

were found with narcissistic tendencies (e.g. Baumeister et al., 2000; Lambe et al., 2018). In romantic relationships, narcissists are perceived as attractive and exciting at the beginning of a relationship, while they are less suitable for long-term relationships due to a lack of intimacy and empathy (Foster & Twenge, 2010). In summary, narcissistic tendencies are associated with both adaptive and maladaptive behaviors and traits. A large part of the personality research of narcissism has been conducted using the NPI (Cain et al., 2008).

Narcissistic Personality Inventory

The first version of the NPI was developed in 1979 by Raskin and Hall. Until today it is considered the most widely used questionnaire in personality psychology to measure narcissistic tendencies in the general population (Twenge et al., 2008). A study has shown that from 1985 to 2006, more than 70 percent of the research on trait narcissism in the field of personality psychology was conducted using the NPI (Cain et al., 2008). The NPI is a well-validated measurement (Miller & Campbell, 2011), that has been used worldwide and translated into several languages (Foster et al., 2003).

The first version of the NPI contains 80 pairs of statements (Raskin & Hall, 1979), while the more refined and popular form today is the NPI with 40 pairs of statements (NPI-40, Raskin & Hall, 1981). Each pair of statements consists of one narcissistic statement and one non-narcissistic statement. In the dichotomous scale format of the NPI-40, the participant is asked to choose between these two statements. The narcissistic statement is rated 1, while the non-narcissistic statement is rated 0. This means that the more narcissistic a person describes himself or herself, the higher the score. The NPI was developed as a subclinical measurement instrument to map narcissistic tendencies on a continuum, with no cutoff point established at which an individual can be regarded a pathological narcissist (Foster & Campbell, 2007). However, the questionnaire was developed based on the description of NPD according to the *DSM-III* (Raskin & Hall, 1979). A study showed that the NPI strongly corresponded with expert ratings of NPD and grandiose narcissism, compared to other narcissism questionnaires (Miller et al., 2014).

The NPI consists of seven facets: 1. Authority ("I like to have authority over people" versus "I don't mind following orders"), 2. Self-sufficiency ("I rarely depend on others to get things done" versus "I sometimes depend on others to get things done"), 3. Superiority ("I am an exceptional person" versus "I am like everyone else"), 4. Exhibitionism ("I like to be the center of attention" versus "I am uncomfortable being the center of attention"), 5. Exploitation ("I can make anyone believe anything I want" versus "People sometimes believe what I tell them"), 6. Vanity ("I like to look at my body" versus "My body is nothing special"), and 7.

Entitlement ("I will never be satisfied until I get everything" versus "I take my satisfaction as it comes"). However, there is much debate about the dimensionality of the NPI and other research suggests three facets, leadership/authority, grandiose exhibitionism, and entitlement/exploitativeness (Ackerman et al., 2011), while others suggest five facets (Ackerman et al., 2016). Within this study, only the total score of the NPI is used. In addition to the NPI-40, various forms have become established over time, such as a form with 37 items (Emmons, 1984) and various short forms with 16 (Ames et al., 2006), 15 (Schütz et al., 2004) or 13 (Gentile et al., 2013) items. Some studies do not use a dichotomous response format but rather Likert scales to assess trait narcissism with the NPI (Ackerman et al., 2016).

Regarding the scores obtained with the NPI, studies have shown that women tend to have lower scores compared to men (e.g. Ames et al., 2006; Foster et al., 2003). It has also been shown that narcissism scores decrease significantly with age (Foster et al., 2003; Roberts et al., 2010). In terms of cultural differences, studies have shown that scores in the USA were higher compared to scores from the Asian region (e.g. Foster et al., 2003). The theory behind this is, that the differences are due to differences in individualism and collectivism in society. The same study showed that mean NPI scores from individualistic societies (North America and Europe) were significantly higher than in collectivistic societies (Asia and the Middle East) (Foster et al., 2003). Recent findings contradict this line of reasoning and showed that samples from Asia and Africa reported higher narcissism scores compared to samples from North America, Europe, and Australia (Fatfouta et al., 2021). Narcissism has received further attention in terms of time trends in narcissism conducted with a CTMA. The study of Twenge et al. (2008), which reported a rapid increase in narcissistic tendencies among U.S. students based on mean NPI scores, received enormous publicity and is representative of the debate about a new "Generation Me" (Twenge, 2013).

In the light of the current evidence, this CTMA used mean NPI scores to analyze time trends in narcissism. To make a valid statement about a trend with the help of a CTMA, it is crucial to be able to include many data points over a long period of time in the analysis. The NPI was developed in 1979, therefore, this study was able to assess time trends over several decades. The measurement has been most widely used to assess narcissism in the general population. The NPI has been used worldwide and is well-validated in several languages, which allowed this study to assess comprehensive time trends in several regions of the world. Previous trend analyses have also been carried out using mean NPI scores (Hamamura et al., 2020; Twenge et al., 2008), which means that the trend analyses can be compared well and enable a

reevaluation and extension of the previous findings. The mean NPI scores obtained over the last 40 years are well suited to perform CTMAs.

Cross Temporal Meta-Analysis

To examine time trends in narcissism, the so-called Cross Temporal Meta-Analysis (CTMA) was used in this study. The method of CTMA has been used since 1997 (Twenge, 1997) to analyze time trends for various psychological constructs. Whereas the 1997 study initially referred to "a time-lag study of cohort differences", it was not until 2000 that Twenge and colleagues called the method CTMA (Twenge, 1997, 2000). The procedure of a CTMA is comparable to “classical” meta-analyses. Inclusion criteria are determined according to which primary studies are identified and, if appropriate, included in the analysis. The relevant variables are extracted and recorded. The most important variables for the CTMA are the year of the data collection, the mean score of the trait under investigation, and the sample size. In contrast to the "classical" meta-analysis, no effect size is calculated, but a mean trend over time is determined. Therefore, a regression analysis is performed between the year of the data collection and the mean scores of the examined construct. The primary data of the included studies are not collected to show a time trend in mean NPI scores. Therefore, the mean scores reported in the studies can be assumed to be unbiased with respect to a trend analysis over time. The mean scores are weighted according to their sample size because it is assumed that large samples represent the population mean better and are therefore weighted more (Twenge et al., 2008). A positive regression coefficient indicates an increase in the construct under investigation for the analyzed group over time and a negative one a decrease over time.

Using this methodology, in addition to analyzing trait narcissism (Gao et al., 2019; Hamamura et al., 2020; Twenge et al., 2008; Twenge et al., 2021), several trends over time have been analyzed over the past 20 years. For example, an increase in student self-esteem from 1968 to 1994 was reported by analyzing the mean scores of the Rosenberg Self-Esteem Scale (Twenge & Campbell, 2001). An increase in crystalline IQ over time in central Europe was shown using a CTMA (Pietschnig et al., 2010). Another CTMA reported a negative trend in attitudes toward seeking mental health services (Mackenzie et al., 2014). And another study examined the change in job characteristics over time using a CTMA (Wegman et al., 2018).

When examining changes over time, the constructs examined are influenced by the age of the sample, period effects, and cohort effects. Age effects can be attributed to biological and social processes of aging, which are independent of period effects and the respective cohort. Period effects refer to external events in society that affect all age groups equally; war or economic crises are examples of period effects. Cohort effects, on the other hand, describe

influences on a cohort that is born at the same time and therefore encounters social changes or historical events at the same age. For example, one could hypothesize that those born after 2000 are influenced by social media differently than those born in the 1960s. In the case of moderator variables such as age, there are two ways to cope with them. One is to include only samples with the same level of the moderator and the other is to account for moderators statistically. In some studies, in which CTMAs are conducted, age is held constant by including only student samples (e.g. Twenge et al., 2008). In this study, analyses were conducted that included only student samples, and in all analyses, age was statistically accounted for. While Twenge et al. (2008) initially assumed that changes over time are more likely due to cohort effects than period effects, more recent studies assume that the two effects cannot be distinguished in a CTMA (Rudolph et al., 2020; Twenge et al., 2021). Period effects and cohort effects must both be considered as possible factors influencing changes over time in the examined construct. Keeping age, period, and cohort effects apart is a common problem in psychological research. The CTMA provides one of the few methods for examining psychological constructs in terms of a time trend. The results provide information about generational differences and temporal changes. This information is meaningful to understand changes in personality traits. The averaged changes in personality traits can be associated with cultural changes.

Objective of the Study

Due to the data available and the introduced current evidence, the following questions were addressed in this study. First, due to ambivalent results regarding a positive trend of narcissism in the USA, time trends with comparable inclusion criteria as in Twenge et al. (2008) were investigated. The analysis was extended to the year 2020 and included in additional analyses for the USA not only student samples but also community and mixed samples. Because of the small number of studies that have examined time trends in other regions using CTMAs, analyses were conducted for the regions of Australia, Asia, Europe, German-speaking countries, and North America. The purpose of these analyses was to examine whether results from the USA can be generalized to other regions. To the knowledge of the author, this study is the first analysis of time trends in narcissism in Europe. At the same time, all studies were included in a worldwide analysis to investigate whether a trend in narcissism can be found on a global level. Based on this analysis, differences in narcissism scores between regions were examined. Recent findings indicated that there was a positive trend in narcissism among students in the USA until 2008, whereas a negative trend has been observed since 2009. This reversal of the trend is explained by the peak of the GFC in 2008, since then a negative trend of narcissism has been shown. To analyze this reversal of trends in narcissism, the included

studies were divided into studies collected before the GFC and studies collected after the GFC. This division made it possible to examine two trends, one for the period before the GFC until the year 2008 and the other for the period after the GFC since the year 2009. The question was whether a reversal could be found again in the USA and whether this reversal could also be found outside the USA. In addition, an exploratory analysis was conducted to determine whether the timing of a trend reversal in 2008 is also reflected in the data, as this has so far only been derived on a theoretical level. Finally, the question of the convergence of narcissism scores between the sexes over time emerged, which is why the time trend for students from the USA and the worldwide time trend were analyzed dependent on sex. Based on these open questions and research gaps, the following hypotheses emerged for this study. The preregistration of the study can be found here (https://osf.io/vzebk).

Hypotheses

1. There will be a positive correlation between year of data collection and the mean NPI scores in the USA (students, overall).

2. There will be a positive correlation between year of data collection and the mean NPI scores in the USA (students, overall) in the period until 2008.

3. Since 2009 there will be a negative correlation between year of data collection and the mean NPI scores in the USA (students, overall).

4. There will be a worldwide correlation between year of data collection and the mean NPI scores.

5. There will be regional (Africa, Australia, Asia, Europe, South America, North America, and German-speaking countries) correlations between year of data collection and the mean NPI scores.

6. There will be a positive correlation between year of data collection and the mean NPI scores in the regional and worldwide analyses in the period until 2008.

7. Since 2009 there will be a negative correlation between the year of data collection and the mean NPI scores in the regional and worldwide analyses.

8. There will be an interaction between sex and year of data collection with women showing significantly larger increases than men.

Method

Literature Search

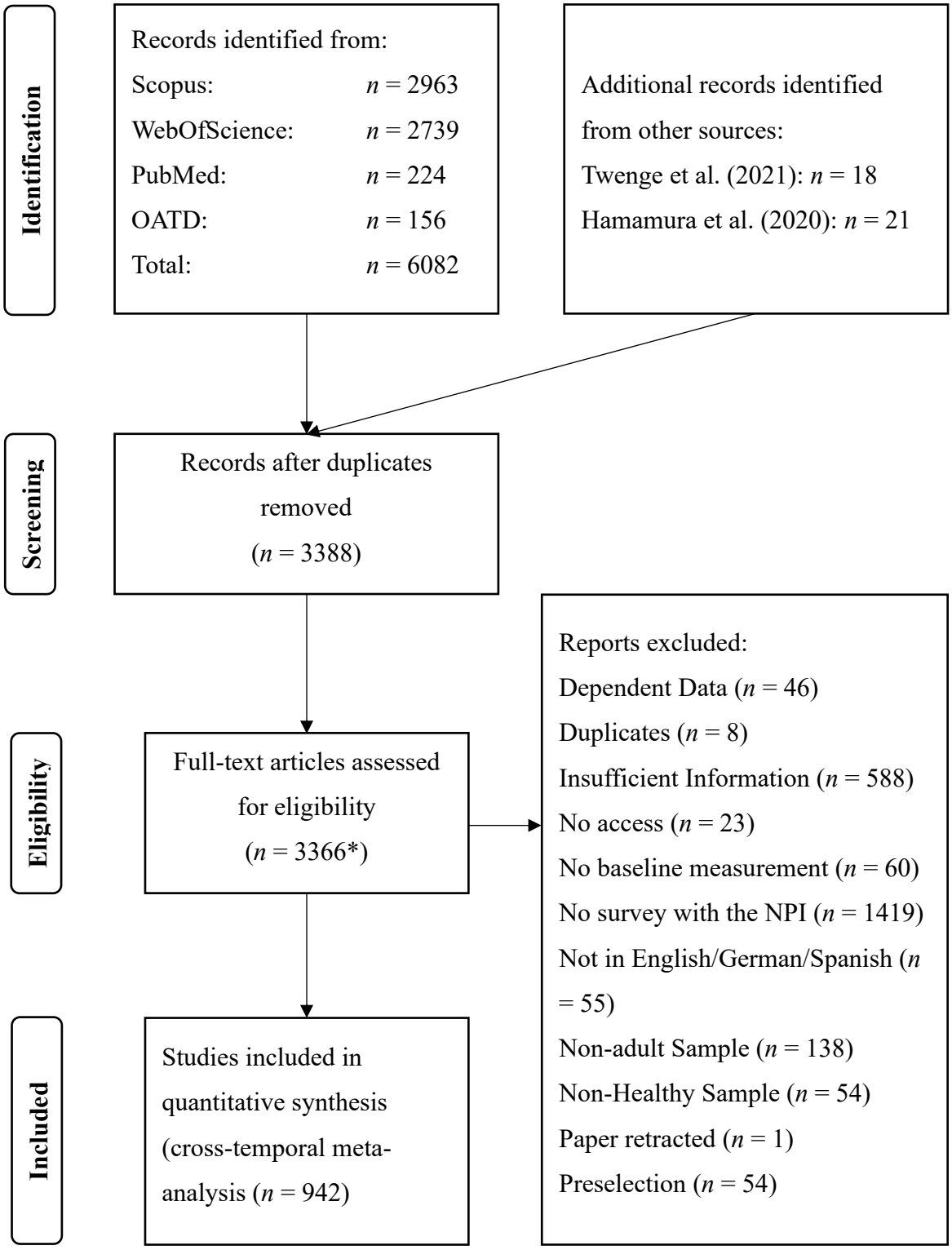
A literature search was conducted to include all relevant study results. Published literature was retrieved by using a cited-reference-search. The search was conducted for publications that cited at least one of the following articles: Raskin and Hall (1981; 1979),

Raskin and Terry (1988), Ames et al. (2006), Emmons (1984), Gentile et al. (2013), Schütz et al. (2004). These articles were selected first, to find all studies that cited the original articles on the development of the NPI, and second, to find all studies that cited the articles of the most commonly used short forms of the NPI. The literature search was conducted on May 21, 2021. This search resulted in 2963 records on *Scopus*, 2739 records on *Web of Science*, and 224 records on *PubMed*. The articles were exported to *EndNote* in RIS format. The following information was exported: author(s), document title, year, source title, volume/issue/pages, citation count, source & document type, publication stage, Digital Object Identifier (DOI), and abstract. Initially, the articles thus obtained were de-duplicated. For a detailed description of the systematic de-duplication see Bramer et al. (2016). Unpublished articles were included via the *Open Access Theses and Dissertation* (*OATD*) platform. The search string "NPI OR Narcissistic AND Personality AND Inventory" identified 156 articles. The full texts of the remaining 3350 articles were assessed according to inclusion criteria. In addition, 21 published and unpublished articles from the meta-analysis by Hamamura et al. (2020) and data from 18 unpublished articles from the meta-analysis by Twenge et al. (2021) were included in the study. The included articles can be found online in the supplementary material in Supplement A (https://osf.io/p38vg/). The detailed study selection process can be seen in the PRISMA flow chart in Figure 1.

To obtain the full text of an article, the DOI was copied from *EndNote* and first searched via *Google Scholar*. With the help of *EndNote Click*, a large majority of the articles could be found and downloaded as PDFs. *EndNote Click* stores library credentials, which allowed the author to have access to articles that the University of Vienna has access to. If the full texts could not be accessed in this way, the article was searched for via *U:search*, the search engine of the University of Vienna (https://usearch.uaccess.univie.ac.at).

Figure 1

PRISMA flowchart representing the study selection process.



Note.

* in addition, 22 unpublished articles by Twenge et al. (2021) and Hamamura et al. (2020) were included without being self-reviewed.

Inclusion Criteria

Articles were selected based on the following inclusion criteria. 1. The articles were examined to determine whether a survey was conducted with the NPI. Articles that only surveyed individual facets of the NPI or specifically used only selected items were not included. 2. Only samples of healthy individuals were included. Accordingly, no clinical samples were included, and no studies were included that were preselected based on narcissism scores (e.g., extreme groups). 3. Only samples with an average age of 18 or older were included. 4. Necessary information had to be reported. The sample mean NPI score, number of subjects, number of NPI items, and response format were necessary information to be included. Sample means were treated as follows. In experimental studies, only baseline scores, scores collected before any treatment, were included. If sample means were broken down by e.g., sex or age, these were included as separate samples. If only mean scores for individual facets were given, an overall mean NPI score was calculated if this was possible based on the information provided. Only studies in English, German, or Spanish were included. Retracted papers were also not included. In case of data dependencies, the larger or first published sample was used.

Coding

Data from suitable studies were coded as follows using the statistic program *IBM statistics SPSS 27* (IBM, 2020). Each sample was assigned a unique ID. For each sample, authors and year of publication were recorded. If the data collection year was not defined, it was coded to two years before publication for published studies and one year before publication for unpublished studies, which follows standard meta-analytical protocol (e.g. Pietschnig et al., 2010; Twenge et al., 2008). If evident, the country of the survey was recorded. In the case that the survey could only be specified to a region, this was coded. For example, if participants from both Austria and Germany were included, this sample was coded as "German-speaking". This breakdown allows the studies to be included in the analysis of regional trends, in this case, Europe. Studies conducted using *Amazon Mechanical Turk* (a crowdsourcing website) that did not clearly define whether the participants were exclusively from the USA were coded as "MTurk" samples. If participants were included from multiple world regions and no specific data per country were provided, then the samples were coded as "multiple". Accordingly, they were only included in the global trend analysis. The same applied to studies from which it was not clear from which country the data originates. The number of study participants was recorded. In rare cases, two different numbers of study participants were reported in articles, in which case the smaller number was coded. The average age of the sample was coded. In some cases, mean NPI scores were given separately by sex, but only an overall sample mean age was

given. In this case, the age average was coded for both the women and the men sample. If evident, the percentage of women in the sample was coded. The status of the publication was binary coded, "published" or "unpublished". The type of sample was coded and differentiated into three categories: “student samples”, “community samples” and “mixed samples”. The mean NPI score of the sample was coded as indicated in the study, the standard deviation was coded, the number of NPI items used in the sample was coded and the respective scale of the NPI items used in the sample was coded. A dichotomous response format was coded as "2," whereas studies that used a Likert scale were coded with the respective number of response options (e.g., studies that used a 5-point Likert scale were coded with "5" in the scale variable). The scale minimum and the scale maximum were coded. If the mean NPI score was given as a proportion between zero and one, the scale minimum was coded "0" and the scale maximum was coded "1". If an absolute mean NPI score was reported, the scale minimum and scale maximum were coded as the range in which the mean score can lie. In the case of the NPI-40, scale minimum was coded as “0” and scale maximum was coded as “40”. Using this coding, the reported mean NPI scores of the different response formats were converted to the NPI-40 format, whereby they become comparable. This procedure was adopted from Hamamura et al. (2020) and an adjusted mean was computed as described in Card (2015). Based on the country in which the data were collected, the samples were assigned to the continents Africa, Asia, Australia (including samples from New Zealand), Europe, North America, and South America. If the sample could not be assigned to a continent, this was also coded. The whole data set can be found online in the supplementary material in Supplement B (https://osf.io/n7kze/).

Using the open-source software package *R 3.6.1* (R Core Team, 2013), the following additional variables were coded: Samples were dummy coded to distinguish between samples that were student samples (= 0) or community and mixed samples (= 1). Samples were dummy coded to distinguish between samples that used an NPI with dichotomous response format (= 0) or an NPI with Likert scale format (= 1). With these variables, it is convenient to perform analyses with samples that have only used the NPI-40 with a dichotomous response format. To test the hypothesis of a change in the trend, after the GFC in 2008, the samples were split in two (samples obtained before and in 2008 = 0) and samples obtained after 2008 = 1). Coding was performed twice, independently by the same coder [PS].

Data Analysis

All statistical analyses in this study were conducted using the open-source software *R 3.6.1* (R Core Team, 2013). The data analysis is based on the CTMA. Three different models were calculated for different sub-samples. First, the samples were subdivided based on the

location of their sampling. In addition to a global analysis of the data, analyses were conducted for Australia, Asia, Europe, and North America, and for two more specific regions, namely German-speaking samples, and samples exclusively from the USA. The various regional data sets were split into two analyses. One included only student samples that used the NPI-40 with a dichotomous response format, referred to as analysis of student samples in the following. Another, more general analysis, included all types of samples. No CTMA was calculated in case of insufficient data, in this case, less than 20 samples. For an overview of the analysis see Table 1.

Table 1

Overview of the different data sets that were analyzed.

Region	Sub-group	Total time span	Before the GFC (until 2008)	After the GFC (since 2009)
USA	Students	362 ✓	184 ✓	178 ✓
	All Samples	699 ✓	283 ✓	416 ✓
Worldwide	Students	511 ✓	220 ✓	391 ✓
	All Samples	1433 ✓	387 ✓	1046 ✓
Europe	Students	54 ✓	9 X	45 ✓
	All Samples	353 ✓	43 ✓	310 ✓
Asia	Students	24 ✓	9 X	15 X
	All Samples	133 ✓	22 ✓	111 ✓
Australia	Students	10 X	3 X	7 X
	All Samples	50 ✓	8 X	42 ✓
North America	Students	421 ✓	197 ✓	224 ✓
	All Samples	810 ✓	309 ✓	501 ✓
German-Speaking Samples	Students	16 X	5 X	11 X
	All Samples	104 ✓	16 X	88 ✓

Note. GFC = Global Financial Crisis; in the students subgroup, only student samples that completed the NPI-40 with dichotomous response format were examined; numbers specify the included samples; a tick means that the analysis was performed while an X means that no analysis was performed because there were insufficient samples (< 20 samples) available.

First, a simple weighted meta-regression was performed for each sub-sample. As usual in cross-temporal meta-analyses, the assumed year of data collection was the independent variable and the adjusted mean NPI score was the dependent variable. The analysis was weighted by sample size. In the second model, a multiple weighted meta-regression was performed. In analyses that included only student samples, the sex ratio and the average age of the sample were included in the model, as additional predictors. In the analyses that included all samples of a specific region, scale format, the number of items, and sample type were additionally included as predictors in the model.

A semi-partial correlation was performed as a third model. In a first step, the mean NPI scores were predicted by the respective additional predictors from the weighted multiple meta-regression. In the second step, the residuals of the mean NPI scores predicted by the other predictors were regressed on the year of data collection.

For each model, the adjusted explained variance, the *F*-statistic, and the number of samples included are reported. For the respective predictors, the unstandardized and standardized regression coefficients, the standard error of the unstandardized coefficient, the partial eta square, and the significance level are reported. According to the standards of psychological research, a result is called significant as soon as a *p*-value below .05 is found. Regarding the interpretation of the effect size of partial eta squares, the guidelines of Cohen (2013) are adopted. Values between .01 and .06 are described as a small effect, values between .06 and .14 as a moderate effect, and values greater than .14 as large effects. It is also reported whether Model 2 explains significantly more variance than Model 1 and in which range the Variance Inflation Factors (VIFs) of the predictors from Model 2 occur.

To examine the temporal trends before and after the GFC, the three models were performed for the period up to 2008 and for the period after 2008. To examine temporal trends in dependence on sex, an interaction term between the year of data collection and sex ratio was added to the multiple-weighted meta-regression model. Time trends in the subgroup of students from the USA and the worldwide subgroup that included all studies were examined for an interaction between the year of data collection and sex. Johnson-Neyman significance regions were used to test whether the association between the year of the data collection and the mean NPI score changed depending on the proportion of women in the sample. In a second step, simple slope analyses were performed for the condition of 100 percent of women in the sample and zero percent of women in the sample.

In the preregistration, it was determined that all data would be included, but a sensitivity analysis was carried out. The mean NPI scores of the student samples were analyzed for

outliers, only one score was further than 3.29 *SD* from the mean (Tabachnick et al., 2007). The analyses without this sample showed only trivial changes and the interpretation of the data would be the same, therefore, all data were used in the main analyses.

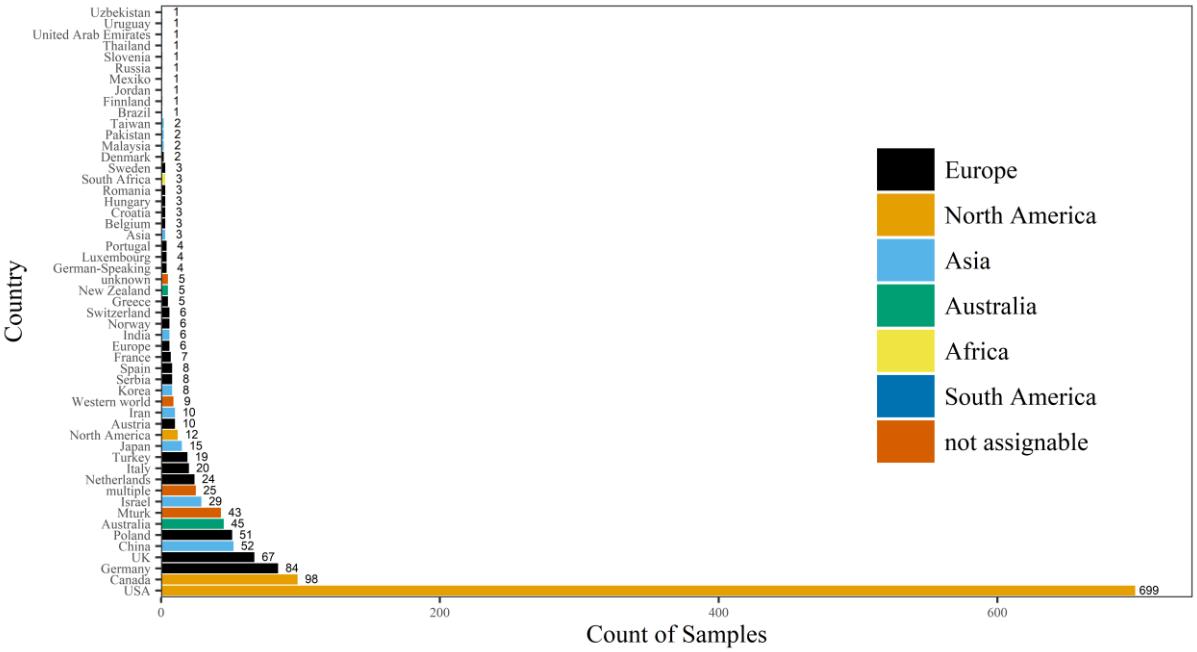
In an exploratory analysis, the trend analysis program *Joinpoint Regression Program 4.9.0.0* (Kim et al., 2000) was used to investigate whether the pattern of the time trend in narcissism changed over time. The subgroup of student samples from the USA was used to analyze the pattern of the time trend in narcissism. First, a weighted mean NPI score of the described samples was calculated for each year. This data frame was then analyzed with the program. The mean NPI scores for each year were set as the dependent variable and the year of data collection as the annual independent variable. Regarding the methodology, the default settings of the *Joinpoint Regression Program* were adopted. This means that a permutation test was carried out with .05 as the overall significance level and 4499 permutations were carried out to find a trend reversal in the data. The code for all analyses can be found online in the supplementary material in Supplement C (https://osf.io/vys4n). All changes from preregistration can be found online in the supplementary material in Supplement E (https://osf.io/924h5).

Final Sample

A total of 1,433 (N = 471,972) independent samples from 942 published and unpublished studies were included in this study. A detailed listing of the inclusion of the studies is shown in the PRISMA flowchart in Figure 1. Samples from 48 countries were retrieved. Most of the data came from North America (N = 810), followed by Europe (N = 353), Asia (N = 133), and Australia (N = 50). Hardly any data was retrieved for the South American (N = 2) and African (N = 3) regions. 82 samples could not be assigned to a region and therefore only play a role in the global analysis. By far the most samples were retrieved from the USA (N = 699), followed by Canada (N = 98), Germany (N = 84), UK (N = 67), China (N = 52), Poland (N = 51), and Australia (N = 45). Less than 30 samples were retrieved for all other countries. A detailed list of samples per country can be found in Figure 2.

Figure 2

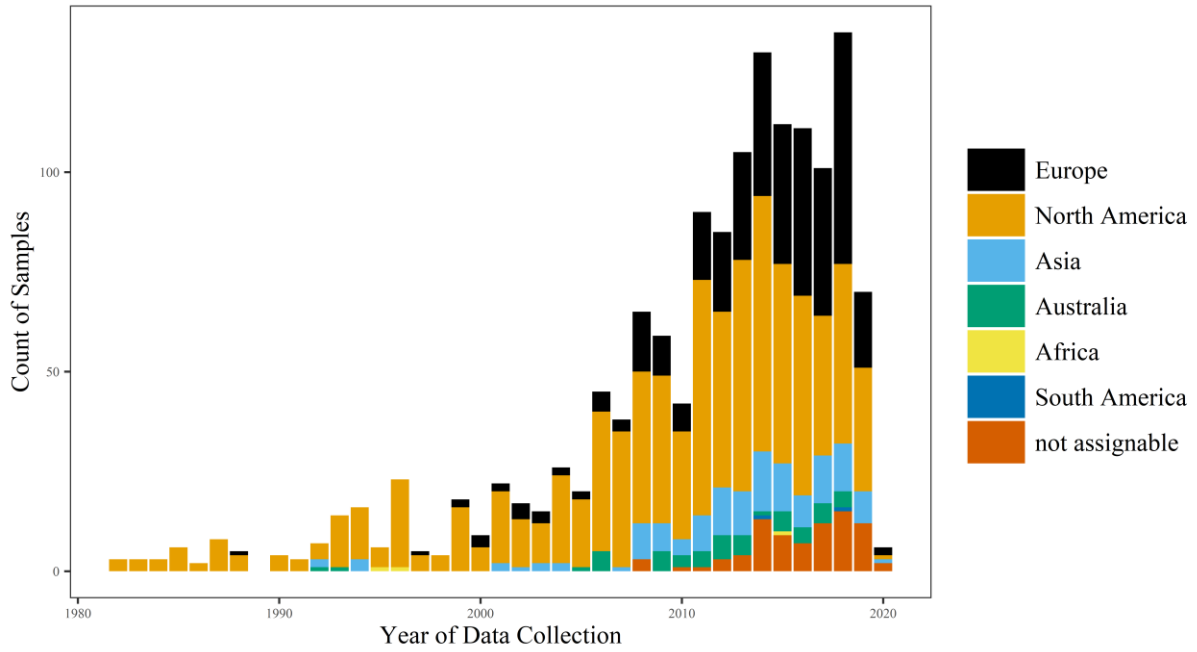
Samples per country



Most samples were student samples (*N* = 829), followed by community samples (*N* = 456), and mixed samples (*N* = 148). Regarding the NPI form, most data were collected with the NPI-40 (*N* = 838), the second most used format was the NPI-16 (*N* = 304). Regarding the response format, most studies used a dichotomous response format (N = 1,233) followed by a 5-Point-Likert-scale response format (*N* = 110). The average age of the study samples was 26.41 (*SD* = 8.38) years and on average 55.93 % of the samples considered themselves to be women. Data on mean age were not available for 244 samples, and data on sex ratio were not available for 67 samples. In the distribution of samples over the years, it was found that the period from 2010 to 2019 had by far the most samples per year, in some cases more than 100 samples per year. In contrast, the number of data points up to the year 2000 is substantially lower. At the same time, it becomes clear that only data for the North American region are available over the entire period. Only since the 2000s has more data become available for the Asian and European regions. The mean year of data collection is 2011. A detailed breakdown of samples per year can be found in Figure 3.

Figure 3

Distribution of samples over time



Results

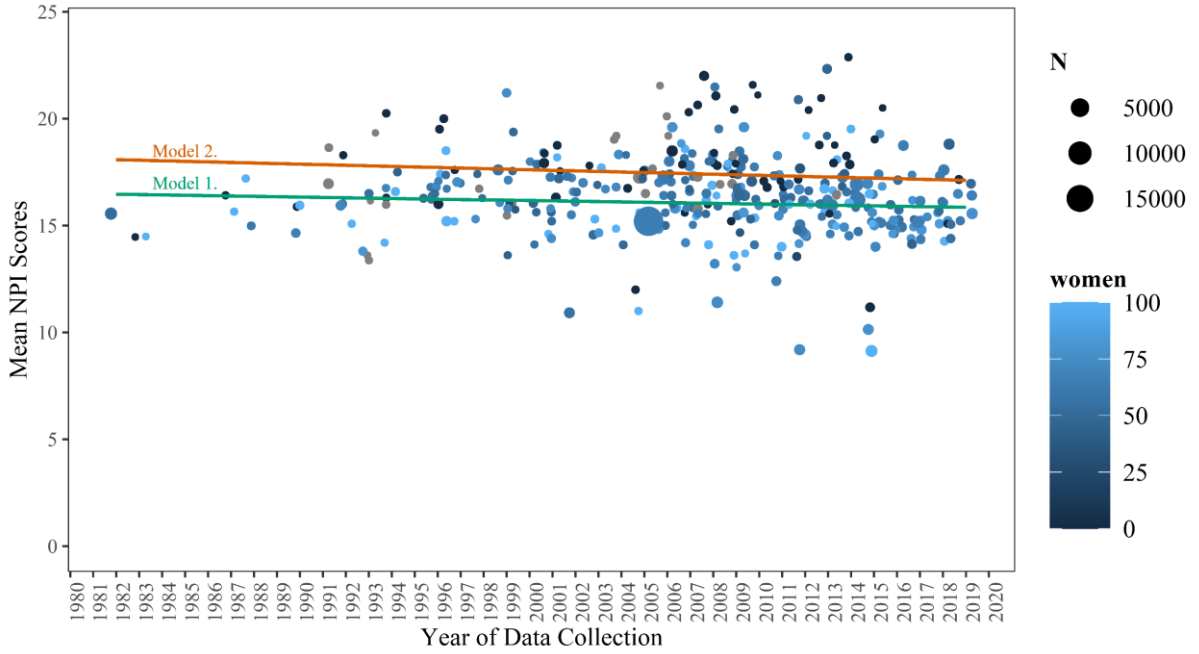
USA

Student-Samples

First, the results from the analyses for the U.S. samples are presented. The following results were obtained by examining the subgroup of student samples of studies that collected data using the NPI-40 with a dichotomous response format, following the inclusion criteria of Twenge et al. (2008). A single linear weighted meta-regression indicated no significant influence of year of data collection on mean NPI scores. Multiple linear weighted meta-regression showed the percentage of women in the sample as the strongest predictor of mean NPI scores (β = -.463; p <.001). This association represents a moderate effect and indicates that on average, female students score lower on the NPI than male students. The year of data collection and sample age showed no significant influence on mean NPI scores. The effects of the year of data collection and sample age on the mean NPI scores remain trivial. Compared to the simple linear regression model, the multiple linear regression model explained significantly more variance (ΔR^2 = .118; p <.001). These results are visualized in Figure 4. The influence of the year of data collection remained non-significant in the semi-partial correlation, in which the influence of sample age and percentage of women on the mean NPI scores was controlled for. All results of this analysis are shown in Appendix A in Table A1.

Figure 4

Student Samples using the original NPI-40 from the USA



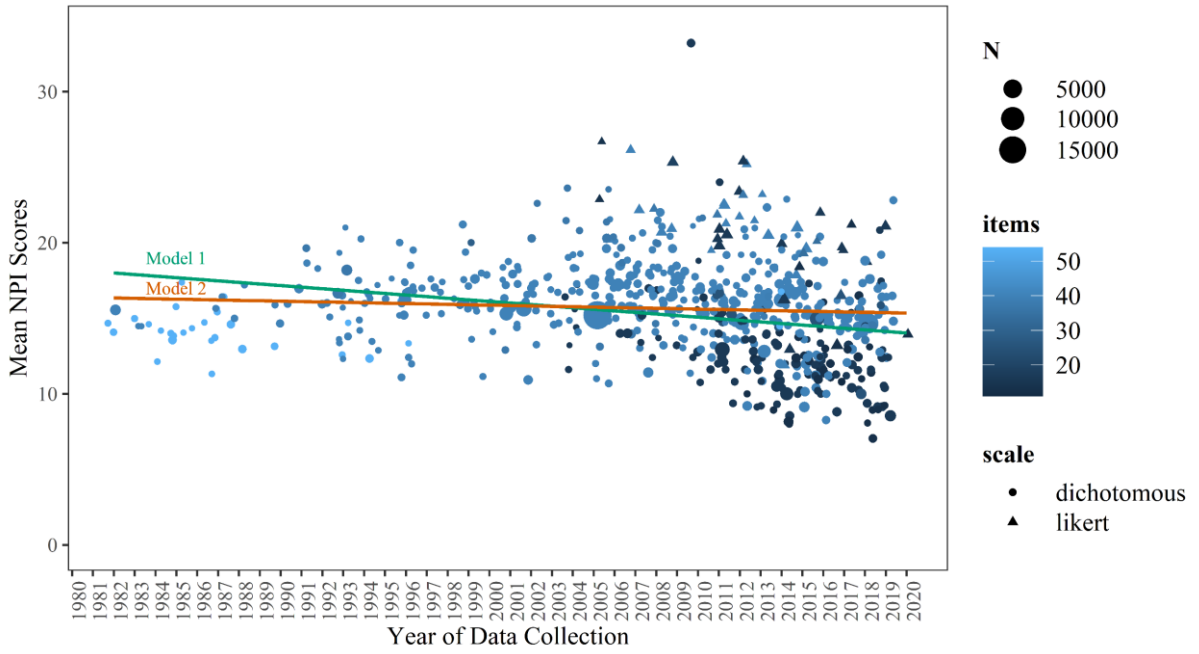
In the period before the GFC (1982 to 2008), the following results emerged. The single linear weighted meta-regression showed no significant influence of the year of data collection on the mean NPI scores. In the multiple linear weighted meta-regression, again, only the percentage of women in the sample was a significant negative predictor for mean NPI scores (β = -.429; p <.001), showing a medium-sized effect in terms of lower mean NPI scores of women. Year of data collection was a nonsignificant positive predictor of mean NPI scores, but there was a small effect in terms of higher mean NPI scores over time. Compared to the simple linear regression model, the multiple linear regression model explained significantly more variance (ΔR^2 = .121; p <.001). In the semi-partial correlation year of data collection was a nonsignificant positive predictor of mean NPI scores, but again a small effect in terms of higher mean NPI scores over time was shown. All results of this analysis are shown in Appendix A in Table A2. In the period after the GFC (2009-2019), only the percentage of women was found to be a significant negative predictor of mean NPI scores in the multiple regression model (β = -.495; p < .001), representing a medium-sized effect. Compared to the simple linear regression model, the multiple linear regression model explained significantly more variance (ΔR^2 = .105; p <.001). During this period, the year of data collection was a nonsignificant negative predictor of mean NPI scores in all three models. However, in all three models, there was a nontrivial small effect in terms of lower mean NPI scores over time. All results of this analysis are shown in Appendix A in Table A3.

All Samples

In the next analyses, all the U.S. samples were included, regardless of the format of the given NPI. The single regression model showed a significant negative effect of year of data collection on the mean NPI score (β = -.275; $p < .001$), representing a moderate effect. This suggests that the mean NPI scores decreased over time. However, in the significantly better fitting Model 2, there was no significant influence of the year of data collection on the mean NPI scores, the effect remained trivial. These results are visualized in Figure 5.

Figure 5

All Samples included from the USA



In Model 2, scale format emerged as the strongest predictor on mean NPI scores (β = .474; $p < .001$). This association represents a large effect and suggests that mean NPI scores are higher when items are answered on a Likert response format compared to a dichotomous response format. The number of items also showed a significant positive influence on mean NPI scores (β = .352; $p < .001$). This association represents a large effect and suggests that mean NPI scores are higher when the NPI contains more items. The percentage of women in the sample was a significant negative predictor (β = -.242; $p < .001$), representing a medium-sized effect. The sample mean age was a significant negative predictor of mean NPI scores (β = -. 268; $p < .001$). This association represents a moderate effect and indicates that the mean NPI scores decrease with the age of the sample. The type of sample showed a significant negative influence on the mean NPI scores (β = -.81; $p = .039$). This association represents a moderate effect and suggests that student samples have higher mean NPI scores compared to mixed and community samples. Compared to the simple linear regression model, the multiple

linear regression model explained significantly more variance ($\Delta R^2 = .450$; $p < .001$). In Model 3, the semi-partial correlation, in which the influence of the year of data collection on the mean NPI scores was adjusted by the confounding variables, no significant influence of the year of data collection was found, and the effect remained trivial. All results of this analysis are shown in Appendix A in Table A4.

In the period before the GFC (1982 to 2008) for this sub-sample, the following results were found. In Model 1, the year of data collection was a significant positive predictor of mean NPI scores (β = .117; p = .043), representing a small effect. This result suggests that the mean NPI scores increased over time. In Model 2, scale emerged as the strongest positive predictor of mean NPI scores (β = .271; $p < .001$), representing a moderate effect. The percentage of women in the sample showed a significant negative influence on mean NPI scores (β = - .237; $p = .001$), representing a moderate effect. Sample mean age showed a significant negative influence on mean NPI scores (β = - .315; $p = .009$), representing a small effect. Importantly, the year of data collection had a significant positive influence on the mean NPI scores (β = .248; $p = .001$), representing a moderate effect. The predictors, number of items, and type of sample showed no significant influence on the dependent variable. Compared with Model 1, Model 2 explained significantly more variance ($\Delta R^2 = .193$; $p < .001$). In Model 3, the year of data collection for the period from 1982 to 2009 emerged as a significant positive predictor of mean NPI scores (β = .227; $p = .004$), representing a small effect. All results of this analysis are shown in Appendix A in Table A5.

In the period after the GFC (2009 to 2020), the results are as follows. In Model 1, the year of data collection was shown to be a significant negative predictor of mean NPI scores (β = -.247; $p < .001$), representing a moderate effect. In the multiple regression, all predictors except sample type showed to be significantly influencing predictors. Scale format emerged as the strongest predictor (β = .531; $p < .001$), representing a large effect. Followed by the influence of number of Items (β = .363; $p < .001$), also representing a large effect. The predictors mean age (β = -.285; $p < .001$) and percentage of women (β = -.238; $p < .001$) showed a significant negative influence on mean NPI scores, both representing moderate effects. The predictor year of data collection showed a significant negative influence on the mean NPI scores (β= -.081; $p = .015$), representing a small effect. Model 2 explained significantly more variance than Model 1($\Delta R^2 = .511$; $p < .001$). The semi-partial correlation model showed a significant negative influence of the year of data collection on the mean NPI scores (β= -.113; $p = .021$), representing a small effect. All results of this analysis are shown in Appendix A in Table A6.

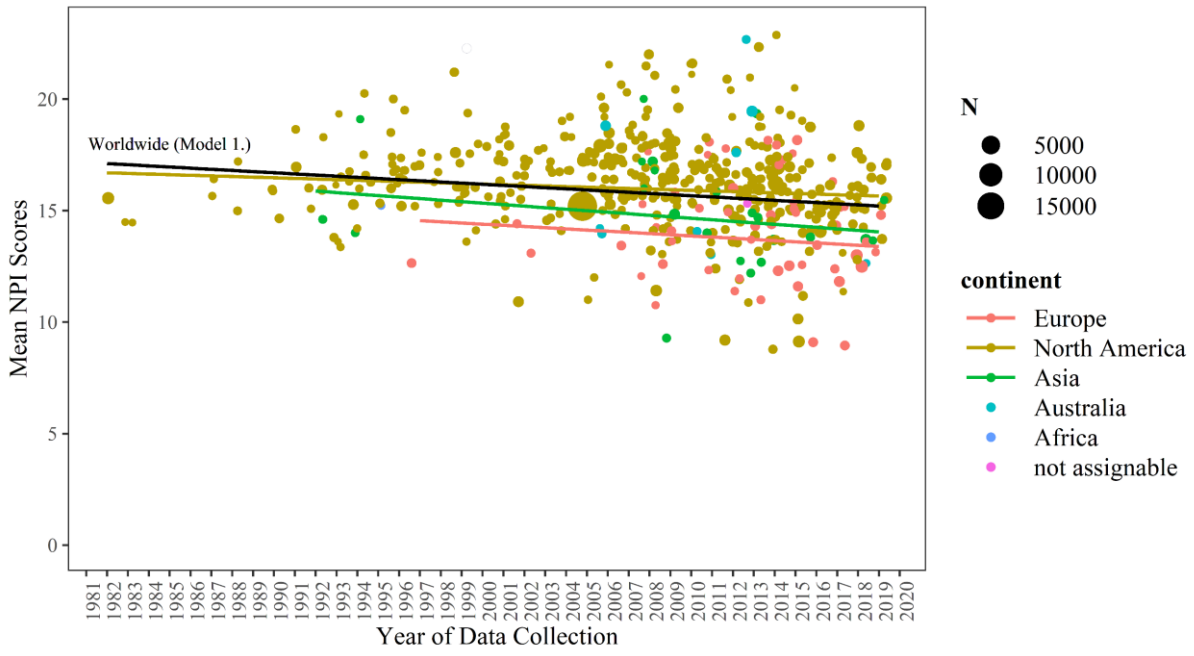
Worldwide

Student-Samples

On a worldwide level, the following results have been obtained. In the analysis of the subgroup of student samples, Model 1 showed a significant negative influence of the year of data collection on mean NPI scores (β = - .174; p < .001), representing a small effect. The worldwide trend line derived from Model 1 is visualized in Figure 6. In Model 2 the percentage of women in the sample emerged as the strongest predictor (β = -.407; p < .001), representing a moderate effect on mean NPI scores. Year of data collection (β = -.192; p = 001) and sample mean age (β = -.142; p = .003) were shown to be significantly negative predictors of mean NPI scores, both representing small effects. Model 2 explained significantly more variance (ΔR^2 = .113; p < .001). In Model 3, the year of data collection was also a significant negative predictor (β = -.180; p = .001), representing a small effect. All data for this analysis can be found in Appendix A in Table A7.

Figure 6

Worldwide and regional trend analyses for student samples using original NPI-40 derived from Model 1 analyses



In the period before the GFC for this sub-sample, the following results have emerged. In Model 1, the year of data collection was not a significant predictor. However, the year of data collection was shown to be a significant positive predictor in Model 2 (β = .180; p = .032), representing a small effect. The percentage of women in the sample was again shown to be the strongest predictor (β = -.415; p < .001), representing a large effect. The sample mean age showed a non-significant negative influence on mean NPI scores in this analysis, but the

association represents a small effect. Model 2 explained significantly more variance than Model 1 (ΔR^2 = .126; p < .001). In Model 3, the year of data collection was a significant positive predictor (β = .182; p = .031), representing a small effect. All data for this analysis can be found in Appendix A in Table A8.

In the period after the GFC, the following results were obtained. In Model 1, the year of data collection was a significant negative predictor (β = -.199; p < .001), representing a small effect. This significant influence was maintained in Model 2 (β = -.175; p = .005), representing a small effect. The predictors sample mean age (β = -.131; p = .019), representing a small effect, and the percentage of women in the sample (β =-.391; p < .001), representing a moderate effect, showed a significant negative influence on the mean NPI scores. Model 2 explained significantly more variance than Model 1 (ΔR^2 = .100; p < .001). Model 3 showed a significant negative influence of the predictor year of data collection on the mean NPI scores (β = -.184; p = .005), representing a small effect. All data for this analysis can be found in Appendix A in Table A9.

All Samples

Including all samples that were available worldwide, the following results emerged. Model 1 showed a significant negative influence of the year of data collection on the mean NPI scores (β = -.235; p < .001), representing a small effect. In Model 2, this negative significant influence was also indicated (β = -.092; p = .002), but the effect size remained trivial. Sample mean age (β = -.154; p < .001), which represents a small effect, percentage of women in sample (β = -.187; p < .001), which represents a small effect, and sample type (β = -.085; p = .002), which represents a trivial effect, were found to have a significant negative influence on mean NPI scores. The scale format (β = .545; p < .001), representing a large effect, and the number of items (β = .264; p < .001), representing a moderate effect, showed a significant positive association with the mean NPI scores. Model 2 explained significantly more variance than Model 1 (ΔR^2 = .510; p < .001). Model 3 showed a significant negative influence of the year of data collection on the mean NPI scores (β = -.093; p = .004), but the effect size remained trivial. These results can be found in Appendix A in Table A10.

In the period before the GFC, the following results were shown. Model 1 did not show a significant trend over time. Model 2 showed a significant positive influence of the year of data collection on mean NPI scores (β = .200; p = .001), representing a small effect. A significant negative influence of the sample mean age (β = -.293; p =.001), representing a small effect, and the percentage of women in the sample (β = -.185; p = .003), representing a small effect, on the mean NPI scores was shown. While the scale format showed a significant positive

association (β = .198; p < .001), which represents a small effect. No significant associations were found for the predictors number of items and type of sample. Model 2 explained significantly more variance (ΔR^2 = .203; p < .001). Model 3 showed a significant positive influence of the year of data collection on the mean NPI scores (β = .178; p = .003), which represents a small effect. All results of this analysis can be found in Appendix A in Table A11.

In the period after the GFC, the following results emerged. In Model 1, the year of data collection was a significant negative predictor (β = -.247; p < .001), representing a moderate effect. In Model 2, year of data collection (β = -.057; p = .003), representing a trivial effect, sample mean age (β = -.126; p < .001), representing a small effect, and percentage of women in sample (β =-.175; p = .001), representing a moderate effect, were found to be significant negative predictors of mean NPI scores. Scale format (β = .566; p < .001), representing a large effect, and number of items (β =.258; p < .001), representing a moderate effect, were significant positive predictors. The type of sample showed no significant influence. Model 2 explained significantly more variance (ΔR^2 = .493; p < .001). Model 3 also showed a significant negative association between the year of data collection and mean NPI scores (β = -.069; p = .012), but the effect size remained trivial. All data can be found in Appendix A in Table A12.

In the following regional analyses, only results related to the predictor year of data collection are reported in detail, because the focus of this study is on analyzing a trend over time. A detailed description of the regional analyses can be found in the tables in Appendix A.

Europe

In the analysis of European student samples, the following results emerged. Over the entire period, from 1997 to 2019, all three models showed a non-significant negative association between the year of data collection on the mean NPI scores. But in all three models, a small effect was evident in terms of lower mean NPI scores over time. The European trend line derived from Model 1 is visualized in Figure 6 and the results can be found in Appendix A in Table A13. Since insufficient samples were found for the pre-GFC period, this analysis was not performed. In the period after the GFC, Model 1 showed a marginally non-significant trend over time (β = -.291; p = .052). Model 2 (β =-.360; p =.037) and Model 3 (β =-.320; p =.037) showed a significant negative trend over time. In all three models, a moderate effect was evident in terms of lower mean NPI scores over time. Model 2 did not explain significantly more variance compared to Model 1. The results can be found in Appendix A in Table A14.

Including all samples from Europe in the analysis, there was no significant influence of year of data collection on mean NPI scores in the period from 1988 to 2020. However, a small effect in terms of lower NPI scores over time was shown in Model 2. Model 2 explained

significantly more variance compared to Model 1 (ΔR^2 = .555; p < .001). The results can be found in Appendix A in Table A15. No significant trend over time was shown for the pre-GFC period, but all three models showed a small effect in terms of lower NPI scores over time. The results can be found in Appendix A in Table A16. The post-GFC analysis showed a significant negative trend in all three models (Model 1: β = -.202; p = .001, Model 2: β =-.197; p < .001, Model 3: β=-.257; p < .001), representing a small effect in Model 1 and moderate effects in Model 2 and 3. Model 2 explained significantly more variance compared to Model 1 (ΔR^2 = .563; p < .001). The results can be found in Appendix A in Table A17.

Asia

The following results were shown for Asia: Including student samples, only one analysis was conducted for the period from 1992 to 2019, because there was insufficient data available to split the analyses. The Models showed no significant influence of year of data collection on mean NPI scores. But moderate effects were shown in all three models in terms of lower mean NPI scores over time. The trendline derived from Model 1 can be found in Figure 6. The results can be found in Appendix A in Table A18. Including all studies from Asia in the analysis, the following results were shown. For the period from 1992 to 2019, Model 1 showed a non-significant negative influence of year of data collection on mean NPI scores, but the association represents a small effect. The significantly better Model 2 (ΔR^2 = .473; p < .001) showed a non-significant positive trend over time; the association represents a small effect. Model 3 showed no significant trend over time and the effect size remained trivial. The results can be found in Appendix A in Table A19. In the period before the GFC, all three models showed a non-significant positive trend over time. In Models 2 and 3 this association represents a small effect. The results can be found in Appendix A in Table A20. In the period after the GFC, Model 1 showed a significant negative trend over time (β = -219; p = 003), representing a moderate effect. Model 2, which explains significantly more variance than Model 1 (ΔR^2 = .413; p < .001), and Model 3 showed non-significant positive trends over time. The association represents a small effect in Model 2 and remains trivial in Model 3. The results can be found in Appendix A in Table A21.

Australia

In the regional analysis for Australia, only analyses including all samples from this region were computed, because an insufficient number of samples were available for the subset of student samples. In the period from 1992 to 2018, non-significant negative time trends were indicated in the analysis of all samples from Australia. This association represents a moderate effect in Model 1, but the effect sizes remain trivial in the significantly better Model 2 (ΔR^2 =

.622; $p < .001$) and in Model 3. These results can be found in Appendix A in Table A22. For the period before the GFC, an insufficient number of samples were available and therefore no analysis was performed. In the period after the GFC, non-significant negative time trends were indicated. This association represents a moderate effect in Model 1, but the effect sizes remain trivial in the significantly better Model 2 ($\Delta R^2 = .639$; $p < .001$) and in Model 3. The results can be found in Appendix A in Table A23.

North America

In the regional analysis for the North American region, the following trends were shown: In the subsample of student samples, a significant negative trend over time was shown in Model 1 from 1982 to 2019 (β = -.106; $p = .040$), representing a small negative effect. The trendline derived from Model 1 can be seen in Figure 6. A significant negative trend over time was also shown in Model 2 (β = -.139; $p = .029$), representing a small effect. Model 2 explained significantly more variance ($\Delta R^2 = .127$; $p < .001$) compared to Model 1. Model 3 showed a significant negative trend (β = -.130; $p = .032$), representing a small effect. The results can be found in Appendix A in Table A24.

In the period from 1982 to 2008, Model 1 showed no significant trend over time and no meaningful effect over time. Model 2 showed a marginally non-significant positive time trend (β = .179; $p = .051$), representing a small effect. Model 2 explained significantly more variance compared to Model 1 ($\Delta R^2 = .127$; $p < .001$). Model 3 showed a marginally non-significant positive time trend (β =.130; $p = .050$), but again a small negative effect was evident. These results can be found in Appendix A in Table A25. For the post-GFC period, Model 1 showed a significant negative trend (β = -.145; $p = .034$), representing a small effect. Model 2, which explained significantly more variance ($R^2 = .124$; $p < .001$), did not show a significant trend over time. Model 3 also revealed no significant trend. In Model 2 and Model 3 small effects were evident in terms of lower NPI scores over time. The results can be found in Appendix A in Table A26.

When all samples from North America were included, Model 1 showed a significant negative trend over time (β = -.283; $p < .001$) for the period from 1982 to 2020, representing a moderate effect. This significant negative trend over time was also shown in Model 2 (β = -.085; $p = .018$) and Model 3 (β = -.090; $p = .029$), the effects remained trivial. Model 2 explained significantly more variance compared to Model 1 ($\Delta R^2 = .453$; $p < .001$). The results can be seen in Appendix A in Table A27.

In the period before the GFC, a significant positive trend was shown in Model 1 (β = .131; $p = .018$), representing a small effect. In Model 2 (β = .278; $p < .001$), and in Model 3 (β

= .262; $p < .001$) significant positive trends were shown, representing moderate effects. Model 2 explained significantly more variance compared to Model 1 ($\Delta R^2 = .154$; $p < .001$). The results can be found in Appendix A in Table A28.

In the period after the GFC, a significant negative trend over time was evident in Model 1 (β = -.243, $p < .001$), representing a moderate effect. In Model 2 (β =-.092; $p = .002$), and Model 3 (β = -.127; $p = .003$) significant negative trends over time were shown, representing small effects. Model 2 explained significantly more variance compared to Model 1 ($\Delta R^2 = .533$; $p < .001$). The results can be found in Appendix A in Table A29.

German-Speaking Countries

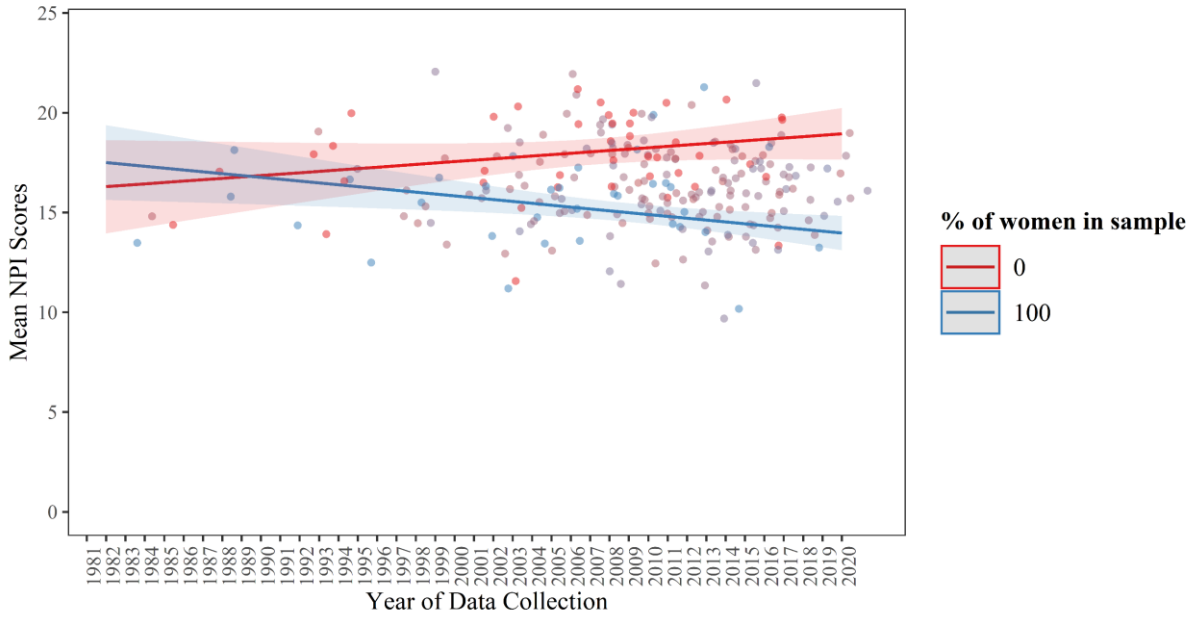
In the regional analysis for the German-speaking countries, the analysis of student samples was not performed due to insufficient data. Analyses including all samples, in the period from 1999 to 2019, showed a significant negative trend over time in Model 1 (β = -.246; $p = .016$), representing a small effect. In Model 2 (β = -.265; $p = .007$), and in Model 3 (β = -.255; $p = .011$) significant negative trends over time were shown, representing moderate effects. Model 2 explained significantly more variance compared to Model 1 ($\Delta R^2 = .418$; $p < .001$). The results can be found in Appendix A in Table A30. The period before the GFC was not examined due to insufficient data available. In the period after the GFC, a significant negative trend over time was shown in Model 1 (β = -.464; $p < .001$), in Model 2 (β = -.333; $p < .001$), and in Model 3 (β = -.327; $p < .001$), representing large effects. Model 2 explained significantly more variance compared to Model 1 ($\Delta R^2 = .582$; $p < .001$). The results can be found in Appendix A in Table A31.

Interaction between Sex and Year of Data Collection

In the interaction model, a significant interaction between the percentage of women in the sample and the year of data collection was evident in the subgroup of student samples from the USA ($b = -0.002$; $p = .022$), representing a small effect. This result suggests that the temporal pattern of narcissism is dependent on sex. The results can be found in Appendix A in Table A32. In a Johnson-Neman analysis, it was shown that a significant negative trend in narcissism is evident from a value greater than 65.26 % of women in the sample. For values below this threshold, there was no significant trend over time. In a simple slope analysis, the condition of 100 % women in the sample showed a significant negative trend of narcissism ($b = -0.093$; $p = .006$), while the condition of no women in the sample showed a non-significant positive trend ($b = 0.070$; $p = .125$). The predicted trendlines for these two conditions are visualized in Figure 7.

Figure 7

Time trends in relation to sex in student samples from the USA



In the interaction model, which included all samples available, a significant interaction between the percentage of women in sample and the year of data collection was evident (b = -0.001; p = .002). The effect size remained trivial. The results can be found in Appendix A in Table A33. In a Johnson-Neman analysis, it was shown that a significant negative trend in narcissism is evident from a value greater than 48.44 % of women in the sample. For values below this threshold, there was no significant trend over time. In a simple slope analysis, the condition of 100 % women in the sample showed a significant negative trend of narcissism (b = -0.108; p < .001), while the condition of no women in the sample showed a non-significant positive trend (b = 0.042; p = .187).

Explorative Analyses

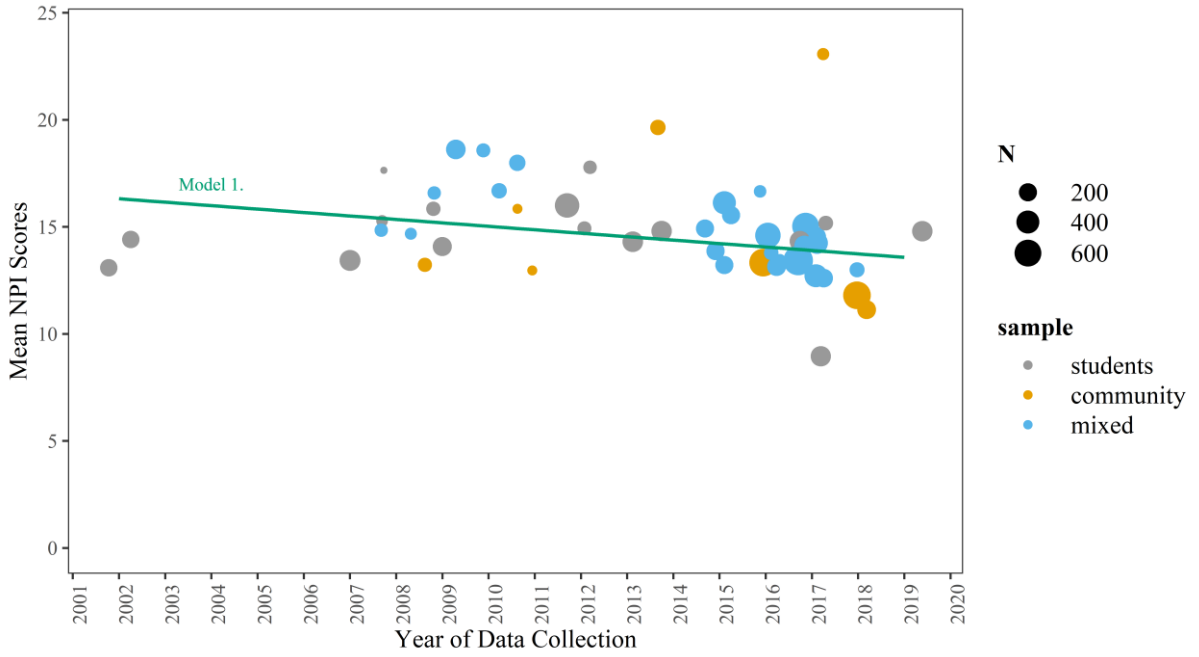
In the exploratory analysis regarding a change in the pattern of the trend over time, the subgroup of students from the USA was examined. Using the annual mean NPI scores for this subgroup, the *Joinpoint Regression Program* model showed a change in trend in 1997. The model, with a change in trend over the period from 1982 to 2019, showed a non-significant positive trend over the period from 1982 to 1997 and a non-significant negative trend over the period from 1997 to 2019. The model that best fit the annual mean NPI scores showed a time trend in which the pattern of the trend in narcissism did not change. This model showed no significant trend over time. The detailed data of this analysis can be found online in the supplementary material in Supplement D (https://osf.io/yvu84/).

An exploratory CTMA was conducted with the subgroup of student samples from Asia, North America, and Europe. To analyze differences in NPI scores based on the regional origin, the variable continent was included as an additional factorial predictor in Model 2. When North America was selected as the reference group, both the European origin of the sample (b = -2.210; p < .001) and Asian origin of the sample (b = -1.396; p = .011) had a significant negative influence on the mean NPI scores. This result suggests that narcissistic tendencies are less pronounced in Asia and Europe compared to North America. However, when Europe was selected as the reference group, there is no significant influence of regional origin on mean NPI scores when compared with Asian samples (b = 0.814; p = .184). This result suggests that narcissistic tendencies in Asia and Europe are not significantly different.

In a final exploratory analysis, a CTMA was conducted for the German-speaking region. Due to the insufficient data available for the subgroup of student samples within the German-speaking region, the inclusion criteria in this explorative analysis were adapted to the extent that community samples and mixed samples were included in addition to the student samples. With these inclusion criteria, 27 mixed and 9 community samples could be included in addition to the 16 student samples from German-speaking countries.

Figure 8

German-Speaking samples using the NPI-40 with dichotomous response format



In this trend analysis, data is available from 2002 to 2019. According to Model 1 a significant negative trend over time was shown (β = -.296; p = .022), representing a moderate effect. This trend is visualized in Figure 8. Model 2, which explained significantly more variance (ΔR^2 = .150; p <.050), also showed a significant negative trend over time (β = -.400;

p = .006), representing a large effect. The analysis showed that the student samples had a significantly lower score than the other samples (β = 1.512; p = .033). In this regard, the type of sample had a moderate effect on the mean NPI scores. As in the other analyses, the percentage of women in the sample was shown to be a significant negative predictor (β = -.639; p = .004) and had a large effect on mean NPI scores in this analysis. Age showed no significant effect on the mean NPI scores in this analysis. Model 3 also showed a significant negative trend over time (β = -.363; p = .010), representing a large effect. The results can be found in Appendix A in Table A34.

Discussion

This study examined time trends in narcissism in a worldwide and comprehensive way. To the author's knowledge, this study is the most exhaustive time trend analysis of trait narcissism as measured by mean NPI scores to date. The objectives of the study were, first, to determine if a positive time trend in narcissism in the USA is evident in this extended set of data. The findings of this study did not indicate a positive trend in narcissism in the USA from 1982 to 2020. Second, analyses were conducted to determine whether time trends in narcissism found in the USA can be generalized to other regions of the world. None of the regional analyses (Asia, Australia, Europe, German-speaking countries, and North America) showed positive time trends in narcissism over the entire period. On the contrary, this study showed meaningful negative time trends in a worldwide analysis and in several regional analyses (North America, Europe, and German-speaking countries). Third, changes in the pattern of time trends in narcissism were analyzed. Trends were analyzed for the time before the GFC in 2008 and trends were analyzed for the time after the GFC, to determine whether the time trends in narcissism changed from a positive to a negative pattern. Only in the subgroup analyses for the USA and North America, different patterns in the time trend of narcissism were shown. A positive time trend was indicated in the period before the GFC in 2008 and a negative time trend was indicated in the period after the GFC. In the analyses for the time after the GFC, meaningful negative time trends in narcissism were shown for Europe, North America (USA), and the German-speaking countries. An analysis was conducted to identify the timing of a change in the pattern of time trends in narcissism based on the available data. In this study, no reversal of the pattern of the time trend in narcissism was evident for the time of the height of the GFC in 2008 and 2009 among students from the USA. Finally, time trends in narcissism were analyzed as a function of sex, to examine whether there was a significantly larger rise in narcissism in women than in men. Unexpectedly, the findings of this study indicated that the average mean

NPI scores of women significantly decreased over time, while the scores of men did not change over time.

Implications

The finding of this study, that no significant positive time trend in narcissism was found among students in the USA, contradicts studies that have found an increasingly narcissistic personality among students in the United States (Twenge & Foster, 2010; Twenge et al., 2008). Including all studies from the USA, the results also showed no meaningful time trend in narcissism. These findings are in line with a study that found no evidence of a positive time trend in students from the USA in the period from 1982 to 2007 (Trzesniewski et al., 2008). Also, in another meta-analysis, the findings indicated no increase in narcissistic tendencies among undergraduates from the USA in the period between 1990 and 2013 (Grijalva et al., 2015). The results could be reconciled with the argument that the positive trend up to 2008 and the negative trend since then have balanced each other out (Twenge et al., 2021). However, this study found no change in the pattern of the time trend in narcissism during the height of the GFC in 2008 among students from the USA.

The results of this study suggest a decline in narcissistic tendencies in North America. Small effects emerged in terms of a negative trend of narcissism from 1982 to 2019 among students. Inclusion of all samples from North America showed indications of negative time trends in narcissism, although this decrease remained trivial in the significantly better Model 2 including further predictors. These findings are in line with small declines in narcissism (d = −0.27) found among students in the USA between 1990 and 2010 (Wetzel et al., 2017). They add to the evidence suggesting an end of the so-called “narcissism epidemic” in the USA (Trzesniewski & Donnellan, 2010; Wetzel et al., 2017).

In the worldwide analyses of time trends in narcissism, this study showed small negative time trends among students in the period from 1982 to 2020. The analysis that included all studies showed significant negative trends over time, however, the effect of these trends remained trivial when further predictors were included in the model. The data included in these analyses were mainly composed of data from the USA in the period from 1982 to the 2000s, while since then data from Asia and Europe have increasingly influenced the trend analyses. In an exploratory finding, the mean NPI scores from North America were found to be significantly higher than those from Asia and Europe. Thus, the worldwide time trends in narcissism may be partly explained by the lower mean NPI scores from Europe and Asia. This result is consistent with previous findings, which reported higher narcissism scores for participants from the USA compared to participants from Europe and Asia (Foster et al., 2003). A common line of

reasoning is that people socialized in strongly individualistic regions have a more pronounced self-focus compared to more collectivistic world regions, which have a more pronounced group focus (Triandis, 2001). North America and Europe tend to be described as individualistic cultures, while Africa and Asia tend to be described as collectivistic cultures. Individualism is thought to be associated with narcissistic tendencies and this association is supposed to be reflected in the narcissism scores from the different world regions. For a more detailed discussion, see Twenge et al. (2003). Unexpectedly, this study found no significant difference between the narcissism scores from Asian student samples and European student samples, contradicting this line of reasoning. This finding is in line with a recent study that challenges the common view and showed that samples from Asia and Africa reported higher narcissism scores compared to samples from North America, Europe, and Australia (Fatfouta et al., 2021). Fatfouta et al. (2021) argued that collectivistic countries are characterized by increasing individualization (Yan, 2010) and that the differences in narcissistic tendencies between world regions are changing accordingly. The results of this study provide partial support for this hypothesis, although the narcissism scores in North America remained the highest compared to Asia and Europe.

In the trend analyses for the European region, indications of a negative temporal trend in narcissism emerged in the period from 1997 to 2019. Both, the subgroup of students and the inclusion of all data from Europe, showed a small effect in terms of decreasing narcissistic tendencies over time. In the more specific analysis for the German-speaking region, in the period between 2002 and 2019, there were moderate to large effects regarding this decrease in narcissistic tendencies. To the author's knowledge, these results are the first trend analysis of narcissism using a CTMA, in Europe, and the German-speaking region. The results for Australia also showed evidence of a negative trend over time, however, the effect size in the better Model 2 remained trivial. This finding is in line with a CTMA that found decreases in narcissism since 2008 in Australia (Hamamura et al., 2020). The trend analysis for Asia showed erratic results in the period from 1992 to 2019. No conclusive finding can be reported regarding a time trend in narcissism. The regional time trends in narcissism in Asia, Australia, and Europe are visualized in Figure 6. They are in line with findings of CTMAs outside the USA (Gao et al., 2019; Hamamura et al., 2020; Stronge et al., 2018) and provide further evidence that no positive time trends in narcissism are evident outside the USA.

In the period before the GFC in 2008, the findings indicated a positive trend of narcissistic tendencies in the USA. The analysis of the subgroup of students showed a small effect in terms of higher mean NPI scores over time. Comparing correlation coefficients with

the findings of Twenge et al. (2008), substantial differences in the strength of the observed temporal trend in narcissism are shown. Twenge et al. (2008) reported a β of .53 ($p < .001$), this study showed a β of .157 ($p = .112$; the results can be found in Appendix A in Table A2). In the period after the GFC, the findings indicated a small negative trend of narcissistic tendencies in the USA among students. These findings are in line with the findings of Twenge et al. (2021). They showed a positive time trend among college students in narcissistic tendencies until 2008 and a negative time trend among them since then. This change in the pattern of the time trend in narcissism was also indicated in the worldwide analyses and the North American trend analyses. In the worldwide analysis of a time trend in narcissism in the period before the GFC (1982 - 2008), a large majority of the data was from the USA (84 % of the student samples). In the analyses for Europe and Asia, no changes in the pattern of time trends in narcissism were evident. In the analyses for Europe, there was a small effect and in the German speaking region a large effect with respect to the decrease in narcissism since 2009. These results suggest that a change in the pattern of time trends in narcissism at the time of the peak of the GFC was only evident in the analyses of the North American samples. The findings of this study also suggest that a positive trend in narcissism is limited to North America, the USA respectively, and was only evident in the period until 2008. Of note, the observed increases in narcissism before the GFC among students in North America, and the USA respectively, were not significant and corresponded to small effects. The same accounts for the observed negative trends after the GFC. Based on these findings, the height of GFC in 2008 as a turning point of the pattern of time trends in narcissism appears less explicit than previously described (Twenge et al., 2021).

In this study, no turning point was found in the pattern of the time trend in narcissism for the time of the height of the GFC in 2008. An exploratory analysis showed a change in the pattern of narcissism scores for the year 1997 among students from the USA. The findings also suggested that a model without a change in the pattern of time trends in narcissism fit the data better compared to a model with a positive trend until 1997 and a subsequent negative trend. These results contradict the argumentation that a change in the pattern of time trends in narcissism is due to societal changes in association with the GFC (Hamamura et al., 2020; Twenge et al., 2021). In conjunction with higher unemployment rates and greater financial dependency, the GFC is argued to have resulted in the inhibition of a narcissistic personality (Bianchi, 2014; Leckelt et al., 2016). The height of the GFC in 2008 as the turning point of the pattern in narcissism is therefore theoretically derived from the association between financially challenging times and decreases in narcissism. This exploratory analysis cannot support the

argument of a change in the time trend of narcissism due to the GFC. Twenge et al. (2021) also showed that economic factors explained narcissism scores up to 2013 better than when scores up to 2016 were included. Statistics of unemployment rates of young adults (15-24) in the USA showed that the rates in 2015 have been back to the level before the GFC and were at a long-term low in 2019 (World-Bank, 2022). These findings collectively suggest that the GFC is an insufficient explanation for the present decreases in narcissistic tendencies. Therefore, further potential factors need to be discussed.

Previous studies have found evidence that showed positive time trends in narcissism in women and smaller differences in narcissistic tendencies between men and women over time (Donnellan et al., 2009; Twenge & Foster, 2010). These increases in narcissistic tendencies among women have been discussed as a possible explanation for a rise in narcissism (e.g.Twenge et al., 2008). Unexpectedly, this study indicated that, on average, the narcissistic tendencies of women were subject to a negative time trend, while the scores of men did not show significant changes over time. These findings were evident in the subgroup of students in the USA and the worldwide analysis including all available data. In a meta-analysis on narcissism, it was shown that the existing sex differences remained stable in the period from 1990 to 2013 (Grijalva et al., 2015). Another study found no evidence of convergence between the scores of women and men on the personality dimension of entitlement (Stronge et al., 2018). Thus, it remains ambiguous on the issue of convergence of narcissism scores. This study suggests that previously found positive trends in narcissism (e.g. Twenge et al., 2008) are not the result of an increase in narcissistic tendencies among women. On the contrary, the findings suggest that the evidence of negative time trends in narcissism are due to decreases in narcissism among women.

Another line of argumentation to explain a possible negative trend in narcissism is the debate of a "Generation We" (Arnett, 2013) which stands in contrast to the "Generation Me" (Twenge, 2013). Among other things, this approach questions a trend towards extrinsic values such as money, image, and fame. It points to studies that indicate, for example, that nowadays more voluntary work is done by young adults than in 1991 (Pryor et al., 2007), that 80 % of students would say that it is more important for them to have a job in which they can be happy than to make a lot of money, or that 86 % would prefer a career that does good in the world (Arnett & Schwab, 2013). In addition, today's generations are more tolerant of people of different ethnicities and sexual orientations compared to older generations (Zogby, 2008). Accordingly, for Arnett et al. (2013) it makes no sense to describe Millennials as a "caricature as a generation of narcissists" (p. 20) and rather emphasize the positive aspects of Millennials.

There are two conflicting views on the generation of the Millennials, one draws the picture of a new “Generation Me” and the other the picture of a “Generation We”. This debate demonstrates the problems of describing generations such as the Baby Boomers or Millennials, in which all individuality is negated, and an entire generation is lumped together. Based on the results of this study, the picture of a "Generation We" can rather be supported. The widely discussed narcissistic “Generation Me” (Twenge, 2013) has led to stereotypes among students today (Grubbs et al., 2019). The findings of this study in terms of a decline in narcissistic tendencies, especially in the last 10 years, should be considered as an argument to change this image of students today.

One phenomenon that is repeatedly addressed, in the debate about the differences between the generations, is the rise of social media and its influence on the so-called digital natives. A large proportion of young adults today are active on various social media channels, and it is part of normal life to have social interactions online (Auxier & Anderson, 2021). A present opinion is that social networking sites encourage self-presentation and narcissistic personalities (e.g. Twenge & Campbell, 2009). A small to moderate association between narcissistic tendencies and social media use was found meta-analytically (McCain & Campbell, 2018). At the same time, it has been shown that the "perfect" world on social networking sites, where only embellished images and the ideal self are shared, can have a negative impact on the self-esteem and well-being of young adults (e.g. Schmuck et al., 2019; Wang et al., 2017). This negative influence is explained by social upward comparison, which is typical in the idealized feeds of social networking sites (Steers et al., 2014). Social comparison serves our self-identity (Festinger, 1954), and in contrast to downward comparison, upward comparison in particular is associated with negative feelings towards the self-image, because the feeling is conveyed that one is worse off than the others (Buunk & Gibbons, 2006). Narcissism is positively related to both self-esteem (Ackerman et al., 2011) and well-being (Sedikides et al., 2004). Accordingly, constant upward social comparisons on social networking sites might also temper narcissistic tendencies. This line of reasoning is also briefly discussed in Twenge et al. (2021) to explain a possible decrease in narcissistic tendencies. This theoretical interpretation of a decrease in narcissistic tendencies due to social upward comparison on social networking sites should be further explored in future research.

Trait narcissism in association with findings of clinical diagnoses or health psychological constructs offers another possible explanation for decreases in trait narcissism. Narcissistic tendencies are inversely related to depressive symptoms and anxiety symptoms (e.g. Raskin & Novacek, 1989; Sedikides et al., 2004). Recent studies and statistics indicate an

increase in depressive symptoms and anxiety disorders among children and adolescents in high-income countries (e.g. Collishaw, 2015; Keyes et al., 2019). In a comprehensive review of trends in mental health in children and adolescents, the findings suggested, that on one hand, the increase is due to increases in help-seeking behavior, changes in diagnostic thresholds and more public and professional awareness about mental health (Collishaw, 2015). On the other hand, the review concludes that there is evidence from cross-cohort comparisons of epidemiological samples that showed substantial increases in symptoms of anxiety and depression among adolescents (Collishaw, 2015). This increase may be one possible factor that relates to decreases in narcissistic tendencies among students. Interestingly, the study also indicates that most of the cross-cohort comparisons found larger increases for girls compared to boys (Collishaw, 2015). This finding could be related to decreases in narcissistic tendencies in women.

Personality traits are influenced by a variety of factors. Financially challenging times, decreases in narcissistic tendencies among women, the constant upward comparison in the feeds of social media, and an increase in depressive symptoms and anxiety symptoms are considered meaningful factors, which can be interpreted in association with decreases in narcissistic tendencies.

This study has found further factors influencing the mean NPI scores. The results of this study indicated that, on average, women have lower narcissistic tendencies compared to men. Sex ratio had a small to moderate effect on the mean NPI scores (except in the Australian subgroup). These findings are in line with previous studies that have found lower mean NPI scores in women compared to men (e.g Ames et al., 2006; Foster et al., 2003). An important consideration is that the differences between the sexes are averaged effects. A study has shown that the differences in narcissism within women and men have a higher variance than the average differences between them (Grijalva et al., 2015). Scale format showed to have large effects on the mean NPI scores. Studies that assessed narcissism with a Likert scale format, reported significantly higher mean scores compared to studies that assessed narcissism with a dichotomous response format. The number of items showed to have small to large effects on the mean NPI scores. The higher the number of items, the higher the mean NPI scores were reported. These findings are visualized in Figure 5 and are in line with another CTMA that analyzed time trends in narcissism in Australia and Canada (Hamamura et al., 2020). Finally, this study found a significant influence of age on narcissistic tendencies. The findings suggest that the mean NPI scores decreased with age. This trend is consistent with a large cross-sectional study that found decreasing narcissism scores with age (Foster et al., 2003). It also

fits the statement of Roberts et al. (2010) saying that "every generation is Generation Me. […] until they grow up" (p. 101).

Limitations

Some points should be considered when interpreting the data of this study. Regarding the level of investigation, it is important to be aware that sample mean scores are investigated over time and no individual scores are included. Since aggregated data is examined, effects may be overestimated (Trzesniewski & Donnellan, 2010).

One issue with CTMA is the requirement that the construct being examined for a trend over time, in this case narcissism, is measured equivalently over time. This condition is important to be able to attribute a change in mean scores over time to the construct being analyzed (Smits et al., 2011). This requirement is often insufficiently investigated or not considered. However, studies have shown that, regarding the measurement invariance of the NPI, individual items do not fulfill this requirement, but the overall NPI score was not negatively influenced (Wetzel, 2017). In addition, in Canadian student samples, it could be shown that the NPI measures the construct narcissism equivalently in samples that were examined 10 years apart (Hamamura et al., 2020). Although these studies suggest equivalent measurement of narcissism over time, it is not possible to fully distinguish whether there has been a change in norms and/or a change in the scores of the latent construct of narcissism using a CTMA (Hamamura et al., 2020).

Generalizability is limited to the available samples. Most of the data were available for North America, followed by Europe and Asia. Almost no data could be included for the South American and African regions. Much of the data comes from the USA. Few data were available outside the USA for the period before 2000. In the global trend analyses within the student samples in the period from 1982 to 2008, 184 (84 %) samples of the 220 samples originate from the USA. Similarly, when all samples up to 2008 are included, 283 (73 %) of the 387 samples are from the USA. Because of this composition, it is difficult to argue for a global trend analysis. The proportion of samples from the USA is so large that it determines the trend to a large extent. The global trend analysis for the period from 2009 to 2019 is also driven by U.S. samples, although the proportion is not as large as in the period before the GFC. In the analysis for students, 178 (61 %) of the 291 samples are from the USA, and when all samples are included, 416 (40 %) of the 1046 samples are from the USA. Due to the available data, it was not possible to analyze time trends among the subgroup of students in the period before the GFC for Europe (German-speaking region), Asia, and Australia. Accordingly, the question of a positive trend up to 2008 outside the USA could only be examined to a limited extent. Nevertheless, analyses

for Europe and Asia for the period before 2008 were conducted based on the analyses that included all samples.

Conclusion

In conclusion, this study represents the most comprehensive time trend analysis of trait narcissism measured by the NPI. This study found no evidence of a positive time trend in narcissism in the USA among students from 1982 to 2020. The results showed meaningful decreases in narcissism in North America, Europe, and the German-speaking region. Only the analyses of data from North America, and the USA respectively, showed a change in the pattern of time trends in narcissism. A positive time trend was indicated before the GFC, and a meaningful negative time trend was shown for the period after the GFC. This change in the pattern of the time trend was not evident in Asia or Europe. Moreover, an analysis showed that when examining the data of student samples from the USA for a change in the pattern of time trends in narcissism, no change in trend was found at the peak of the GFC in 2008. These findings suggest that the factor of financially challenging times in the context of the GFC in 2008, is not sufficient to explain a change in the pattern of narcissism over time. Unexpectedly, this study suggests that the found decline in narcissistic tendencies is in part due to substantial decreases in mean NPI scores among women. In the light of the findings of this study, it can be said that the so-called "epidemic of narcissism" died at the latest in the period of the last decade. It is probably more appropriate to examine why the scores of the NPI are subject to a negative trend. Besides financially challenging times and decreases in narcissistic tendencies among women, the constant upward comparison in the feeds of social media, and an increase in depressive symptoms and anxiety symptoms are considered as possible factors that can be related to decreases in narcissistic tendencies. Future research should investigate whether negative time trends in narcissism are empirically related to the introduced factors.

References

Ackerman, R. A., Donnellan, M. B., Roberts, B. W., & Fraley, R. C. (2016). The effect of response format on the psychometric properties of the Narcissistic Personality Inventory: Consequences for item meaning and factor structure. *Assessment, 23*(2), 203-220. https://doi.org/10.1177/1073191114568113

Ackerman, R. A., Witt, E. A., Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., & Kashy, D. A. (2011). What does the narcissistic personality inventory really measure? *Assessment, 18*(1), 67-87. https://doi.org/10.1177/1073191110382845

Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of Research in Personality, 40*(4), 440-450. https://doi.org/10.1016/j.jrp.2005.03.002

APA. (1980). *Diagnostic and statistical manual of mental disorders : DSM-III*. American Psychiatric Assoc.

APA. (2000). *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Revised*. American Psychiatric Assoc.

Arnett, J. J. (2013). The evidence for generation we and against generation me. *Emerging Adulthood, 1*(1), 5-10. https://doi.org/10.1177/2167696812466842

Auxier, B., & Anderson, M. (2021). Social media use in 2021. *Pew Research Center, 1*, 1-4.

Back, M. D., Küfner, A. C., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. (2013). Narcissistic admiration and rivalry: disentangling the bright and dark sides of narcissism. *Journal of Personality and Social Psychology, 105*(6), 1013. https://doi.org/10.1037/a0034431

Baumeister, R. F., Bushman, B. J., & Campbell, W. K. (2000). Self-esteem, narcissism, and aggression: Does violence result from low self-esteem or from threatened egotism? *Current directions in psychological science, 9*(1), 26-29. https://doi.org/10.1111/1467-8721.00053

Bianchi, E. C. (2014). Entering Adulthood in a Recession Tempers Later Narcissism. *Psychological Science, 25*(7), 1429-1437. https://doi.org/10.1177/0956797614532818

Bianchi, E. C. (2016, Oct). American individualism rises and falls with the economy: Cross-temporal evidence that individualism declines when the economy falters. *Journal of Personality and Social Psychology, 111*(4), 567-584. https://doi.org/10.1037/pspp0000114

Bramer, W. M., Giustini, D., De Jonge, G. B., Holland, L., & Bekhuis, T. (2016). De-duplication of database search results for systematic reviews in EndNote. *Journal of the*

Medical Library Association, 104(3), 240-243. https://doi.org/10.3163/1536-5050.104.3.014

Brinkmann, R. D. (2021). *Angewandte Gesundheitspsychologie* (2., aktualisierte Auflage. ed.). Pearson. https://ubdata.univie.ac.at/AC16292446

Bulfinch, T. (1913). *The age of fable: Or, stories of gods and heroes*. Crowell.

Buunk, A. P., & Gibbons, F. X. (2006). Social comparison orientation: A new perspective on those who do and those who don't compare with others. In *Social Comparison and Social Psychology: Understanding Cognition, Intergroup Relations, and Culture* (pp. 15-32). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511584329.003

Cain, N. M., Pincus, A. L., & Ansell, E. B. (2008). Narcissism at the crossroads: Phenotypic description of pathological narcissism across clinical theory, social/personality psychology, and psychiatric diagnosis. *Clinical Psychology Review, 28*(4), 638-656. https://doi.org/10.1016/j.cpr.2007.09.006

Campbell, W. K., Bonacci, A. M., Shelton, J., Exline, J. J., & Bushman, B. J. (2004). Psychological entitlement: Interpersonal consequences and validation of a self-report measure. *Journal of Personality Assessment, 83*(1), 29-45. https://doi.org/10.1207/s15327752jpa8301_04

Campbell, W. K., & Foster, J. D. (2007). The narcissistic self: Background, an extended agency model, and ongoing controversies. *The self, 115*, 138.

Card, N. A. (2015). *Applied meta-analysis for social science research*. Guilford Publications.

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. Routledge.

Collishaw, S. (2015). Annual research review: secular trends in child and adolescent mental health. *Journal of Child Psychology and Psychiatry, 56*(3), 370-393. https://doi.org/10.1111/jcpp.12372

Curran, T., & Hill, A. P. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin, 145*(4), 410. https://doi.org/10.1037/bul0000138

Dhawan, N., Kunik, M. E., Oldham, J., & Coverdale, J. (2010). Prevalence and treatment of narcissistic personality disorder in the community: a systematic review. *Comprehensive Psychiatry, 51*(4), 333-339. https://doi.org/10.1016/j.comppsych.2009.09.003

Dimock, M. (2019). Defining generations: Where Millennials end and Generation Z begins. *Pew Research Center, 17*(1), 1-7.

Donnellan, M. B., Trzesniewski, K. H., & Robins, R. W. (2009). An emerging epidemic of narcissism or much ado about nothing? *Journal of Research in Personality, 43*(3), 498-501. https://doi.org/10.1016/j.jrp.2008.12.010

Emmons, R. A. (1984, Jun). Factor analysis and construct validity of the Narcissistic Personality Inventory. *Journal of Personality Assessment, 48*(3), 291-300. https://doi.org/10.1207/s15327752jpa4803_11

Fatfouta, R., Sawicki, A., & Żemojtel-Piotrowska, M. (2021). Are individualistic societies really more narcissistic than collectivistic ones? A five-world region cross-cultural re-examination of narcissism and its facets. *Personality and Individual Differences, 183*, 111-163. https://doi.org/10.1016/j.paid.2021.111163

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*(2), 117-140.

Foster, J. D., Campbell, W. K., & Twenge, J. M. (2003). Individual differences in narcissism: Inflated self-views across the lifespan and around the world. *Journal of Research in Personality, 37*(6), 469-486. https://doi.org/10.1016/S0092-6566(03)00026-6

Foster, J. D., & Twenge, J. M. (2010). Narcissism and relationships: From light to dark. In *The dark side of close relationships II* (pp. 401-428). Routledge. https://doi.org/10.4324/9780203874370

Freestone, M., Osman, M., & Ibrahim, Y. (2022). On the uses and abuses of narcissism as a public health issue. *The British Journal of Psychiatry, 220*(2), 54-57. https://doi.org/10.1192/bjp.2020.70

Freud, S. (2014). *On narcissism: An introduction*. Read Books Ltd.

Gao, S., Thomaes, S., Van Den Noortgate, W., Xie, X., Zhang, X., & Wang, S. (2019). Recent changes in narcissism of Chinese youth: A cross-temporal meta-analysis, 2008–2017. *Personality and Individual Differences, 148*, 62-66. https://doi.org/10.1016/j.paid.2019.05.035

Gentile, B., Miller, J. D., Hoffman, B. J., Reidy, D. E., Zeichner, A., & Campbell, W. K. (2013). A test of two brief measures of grandiose narcissism: The Narcissistic Personality Inventory–13 and the Narcissistic Personality Inventory-16. *Psychological Assessment, 25*(4), 1120–1136. https://doi.org/10.1037/a0033192

Gentile, B., Twenge, J. M., & Campbell, W. K. (2010). Birth Cohort Differences in Self-Esteem, 1988–2008: A Cross-Temporal Meta-Analysis. *Review of General Psychology, 14*(3), 261-268. https://doi.org/10.1037/a0019919

Greenfield, P. M. (2009, Mar). Linking social change and developmental change: shifting pathways of human development. *Developmental Psychology, 45*(2), 401-418. https://doi.org/10.1037/a0014726

Greenfield, P. M. (2016). Social change, cultural evolution, and human development. *Current Opinion in Psychology, 8*, 84-92. https://doi.org/10.1016/j.copsyc.2015.10.012

Grijalva, E., Newman, D. A., Tay, L., Donnellan, M. B., Harms, P. D., Robins, R. W., & Yan, T. (2015). Gender differences in narcissism: a meta-analytic review. *Psychological Bulletin, 141*(2), 261. https://doi.org/10.1037/a0038231

Grossmann, I., & Varnum, M. E. W. (2015). Social Structure, Infectious Diseases, Disasters, Secularism, and Cultural Change in America. *Psychological Science, 26*(3), 311-324. https://doi.org/10.1177/0956797614563765

Grubbs, J. B., Exline, J. J., McCain, J., Campbell, W. K., & Twenge, J. M. (2019). Emerging adult reactions to labeling regarding age-group differences in narcissism and entitlement. *PLoS ONE, 14*(5). https://doi.org/10.1371/journal.pone.0215637

Grubbs, J. B., & Riley, A. C. (2018). Generational differences in narcissism and narcissistic traits. In *Handbook of Trait Narcissism* (pp. 183-191). Springer. https://doi.org/10.1007/978-3-319-92171-6_20

Hamamura, T., Johnson, C. A., & Stankovic, M. (2020). Narcissism over time in Australia and Canada: A cross-temporal meta-analysis. *Personality and Individual Differences, 155*, 109707. https://doi.org/10.1016/j.paid.2019.109707

Hendin, H. M., & Cheek, J. M. (1997). Assessing hypersensitive narcissism: A reexamination of Murray's Narcism Scale. *Journal of Research in Personality, 31*(4), 588-599. https://doi.org/10.1006/jrpe.1997.2204

IBM. (2020). *IBM SPSS Statistics for Windows, Version 27.0*. IBM Corp.

Jones, D. N., & Paulhus, D. L. (2011). The role of impulsivity in the Dark Triad of personality. *Personality and Individual Differences, 51*(5), 679-682. https://doi.org/10.1016/j.paid.2011.04.011

Jones, D. N., & Paulhus, D. L. (2014). Introducing the short dark triad (SD3) a brief measure of dark personality traits. *Assessment, 21*(1), 28-41. https://doi.org/10.1177/1073191113514105

Kernberg, O. F. (1985). *Borderline conditions and pathological narcissism*. Rowman & Littlefield.

Keyes, K. M., Gary, D., O'Malley, P. M., Hamilton, A., & Schulenberg, J. (2019). Recent increases in depressive symptoms among US adolescents: trends from 1991 to 2018.

Social psychiatry and psychiatric epidemiology, 54(8), 987-996. https://doi.org/10.1007/s00127-019-01697-8

Kim, H. J., Fay, M. P., Feuer, E. J., & Midthune, D. N. (2000). Permutation tests for joinpoint regression with applications to cancer rates. *Statistics in medicine, 19*(3), 335-351. https://doi.org/10.1002/(SICI)1097-0258(20000215)19:3<335::AID-SIM336>3.0.CO;2-Z

Kohut, H. (1971). The Analysis of the Self. A Systematic Approach to the Psychoanalytic Treatment of Narcistic Personality Disorders.

Konrath, S. H. (2007). *Egos Inflating over Time: Rising Narcissism and its Implications for Self-Construal, Cognitive Style, and Behavior* [Doctoral dissertation, University of Michigan]. Michigan.

Konrath, S. H., O'Brien, E. H., & Hsing, C. (2011). Changes in Dispositional Empathy in American College Students Over Time: A Meta-Analysis. *Personality and Social Psychology Review, 15*(2), 180-198. https://doi.org/10.1177/1088868310377395

Lambe, S., Hamilton-Giachritsis, C., Garner, E., & Walker, J. (2018). The role of narcissism in aggression and violence: A systematic review. *Trauma, Violence, & Abuse, 19*(2), 209-230. https://doi.org/10.1177/1524838016650190

Leckelt, M., Back, M. D., Foster, J. D., Hutteman, R., Jaeger, G. J., McCain, J. L., Twenge, J. M., & Campbell, W. K. (2016). Entering adulthood in a recession tempers later narcissism - But only in men. *Journal of Research in Personality, 60*, 8-11. https://doi.org/10.1016/j.jrp.2015.10.006

Liu, D., & Xin, Z. (2015). Birth Cohort and Age Changes in the Self-Esteem of Chinese Adolescents: A Cross-Temporal Meta-Analysis, 1996-2009. *Journal of Research on Adolescence, 25*(2), 366-376. https://doi.org/10.1111/jora.12134

Mackenzie, C. S., Erickson, J., Deane, F. P., & Wright, M. (2014). Changes in attitudes toward seeking mental health services: A 40-year cross-temporal meta-analysis. *Clinical Psychology Review, 34*(2), 99-106. https://doi.org/10.1016/j.cpr.2013.12.001

Malesza, M., & Kaczmarek, M. C. (2018). Grandiose narcissism versus vulnerable narcissism and impulsivity. *Personality and Individual Differences, 126*, 61-65. https://doi.org/10.1016/j.paid.2018.01.021

McCain, J. L., & Campbell, W. K. (2018). Narcissism and social media use: A meta-analytic review. *Psychology of Popular Media Culture, 7*(3), 308. https://doi.org/10.1037/ppm0000137

Miller, J. D., & Campbell, W. K. (2011). Addressing criticisms of the narcissistic personality inventory (NPI). *The handbook of narcissism and narcissistic personality disorder: Theoretical approaches, empirical findings, and treatments*, 146-152. https://doi.org/10.1002/9781118093108.ch13

Miller, J. D., McCain, J., Lynam, D. R., Few, L. R., Gentile, B., MacKillop, J., & Campbell, W. K. (2014). A comparison of the criterion validity of popular measures of narcissism and narcissistic personality disorder via the use of expert ratings. *Psychological Assessment, 26*(3), 958. https://doi.org/10.1037/a0036613

Oshio, A., Okada, R., Mogaki, M., Namikawa, T., & Wakita, T. (2014). Age and survey-year effects on self-esteem in Japan: A cross-temporal meta-analysis of scores on Rosenberg's Self-Esteem Scale. *Japanese Journal of Educational Psychology, 62*(4), 273-282. https://doi.org/10.5926/jjep.62.273

Paulhus, D. L. (2001). Normal narcissism: Two minimalist accounts. *Psychological Inquiry, 12*(4), 228-230.

Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality, 36*(6), 556-563. https://doi.org/10.1016/S0092-6566(02)00505-6

Pietschnig, J., Voracek, M., & Formann, A. K. (2010). Pervasiveness of the IQ Rise: A Cross-Temporal Meta-Analysis. *PLoS ONE, 5*(12), e14406. https://doi.org/10.1371/journal.pone.0014406

R Core Team. (2013). R: A language and environment for statistical computing.

Raskin, R., & Hall, C. S. (1981). The Narcissistic Personality Inventory: alternative form reliability and further evidence of construct validity. *Journal of Personality Assessment, 45*(2), 159-162. https://doi.org/10.1207/s15327752jpa4502_10

Raskin, R., & Novacek, J. (1989). An MMPI description of the narcissistic personality. *Journal of Personality Assessment, 53*(1), 66-80. https://doi.org/10.1207/s15327752jpa5301_8

Raskin, R., & Terry, H. (1988). A Principal-Components Analysis of the Narcissistic Personality Inventory and Further Evidence of Its Construct Validity. *Journal of Personality and Social Psychology 54*(5), 890-902. https://doi.org/10.1037//0022-3514.54.5.890

Raskin, R. N., & Hall, C. S. (1979). A narcissistic personality inventory. *Psychological Reports*. https://doi.org/10.2466/pr0.1979.45.2.590

Roberts, B. W., Edmonds, G., & Grijalva, E. (2010). It is developmental me, not generation me: Developmental changes are more important than generational changes in

narcissism—Commentary on Trzesniewski & Donnellan (2010). *Perspectives on Psychological Science*, *5*(1), 97-102. https://doi.org/10.1177/1745691609357019

Rudolph, C. W., Costanza, D. P., Wright, C., & Zacher, H. (2020). Cross-Temporal Meta-Analysis: A Conceptual and Empirical Critique. *Journal of Business and Psychology*, *35*(6), 733-750. https://doi.org/10.1007/s10869-019-09659-2

Schmuck, D., Karsay, K., Matthes, J., & Stevic, A. (2019). "Looking Up and Feeling Down". The influence of mobile social networking site use on upward social comparison, self-esteem, and well-being of adult smartphone users. *Telematics and Informatics*, *42*, 101240. https://doi.org/10.1016/j.tele.2019.101240

Schütz, A., Marcus, B., & Sellin, I. (2004). Die Messung von Narzissmus als Persönlichkeitskonstrukt. *Diagnostica*, *50*(4), 202-218. https://doi.org/10.1026/0012-1924.50.4.202

Sedikides, C. (2021). In search of narcissus. *Trends in Cognitive Sciences*, *25*(1), 67-80. https://doi.org/10.1016/j.tics.2020.10.010

Sedikides, C., Rudich, E. A., Gregg, A. P., Kumashiro, M., & Rusbult, C. (2004). Are normal narcissists psychologically healthy?: self-esteem matters. *Journal of Personality and Social Psychology*, *87*(3), 400-416. https://doi.org/10.1037/0022-3514.87.3.400

Smits, I. A., Dolan, C. V., Vorst, H., Wicherts, J. M., & Timmerman, M. E. (2011). Cohort differences in Big Five personality factors over a period of 25 years. *Journal of Personality and Social Psychology*, *100*(6), 1124–1138. https://doi.org/10.1037/a0022874

Steers, M.-L. N., Wickham, R. E., & Acitelli, L. K. (2014). Seeing everyone else's highlight reels: How Facebook usage is linked to depressive symptoms. *Journal of Social and Clinical Psychology*, *33*(8), 701-731. https://doi.org/10.1521/jscp.2014.33.8.701

Stein, J. (2013). Millennials: The me me me generation. *Time magazine*, *20*, 1-8.

Stinson, F. S., Dawson, D. A., Goldstein, R. B., Chou, S. P., Huang, B., Smith, S. M., Ruan, W. J., Pulay, A. J., Saha, T. D., & Pickering, R. P. (2008). Prevalence, correlates, disability, and comorbidity of DSM-IV narcissistic personality disorder: results from the wave 2 national epidemiologic survey on alcohol and related conditions. *Journal of Clinical Psychiatry*, *69*(7), 1033-1045. https://doi.org/10.4088/jcp.v69n0701

Stronge, S., Milojev, P., & Sibley, C. G. (2018). Are People Becoming More Entitled Over Time? Not in New Zealand. *Personality and Social Psychology Bulletin*, *44*(2), 200-213. https://doi.org/10.1177/0146167217733079

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Pearson.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality, 69*(6), 907-924. https://doi.org/10.1111/1467-6494.696169

Trzesniewski, K. H., & Donnellan, M. B. (2010). Rethinking "Generation Me": A Study of Cohort Effects from 1976-2006. *Perspectives on Psychological Science, 5*(1), 58-75. https://doi.org/10.1177/1745691609356789

Trzesniewski, K. H., Donnellan, M. B., & Robins, R. W. (2008). Do today's young people really think they are so extraordinary? An examination of secular trends in narcissism and self-enhancement. *Psychological Science, 19*(2), 181-188. https://doi.org/10.1111/j.1467-9280.2008.02065.x

Twenge, J. M. (1997). Changes in masculine and feminine traits over time: A meta-analysis. *Sex Roles, 36*(5-6), 305-325. https://doi.org/10.1007/BF02766650

Twenge, J. M. (2000). The age of anxiety? The birth cohort change in anxiety and neuroticism, 1952–1993. *Journal of Personality and Social Psychology, 79*(6), 1007. https://doi.org/10.1037//0022-3514.79.6.1007

Twenge, J. M. (2001). Changes in women's assertiveness in response to status and roles: A cross-temporal meta-analysis, 1931–1993. *Journal of Personality and Social Psychology, 81*(1), 133. https://doi.org/10.1037/0022-3514.81.1.133

Twenge, J. M. (2013). The evidence for generation me and against generation we. *Emerging Adulthood, 1*(1), 11-16. https://doi.org/10.1177/2167696812466548

Twenge, J. M., & Campbell, W. K. (2001). Age and Birth Cohort Differences in Self-Esteem: A Cross-Temporal Meta-Analysis. *Personality and Social Psychology Review, 5*(4), 321-344. https://doi.org/10.1207/s15327957pspr0504_3

Twenge, J. M., & Campbell, W. K. (2009). *The narcissism epidemic: Living in the age of entitlement*. Simon and Schuster.

Twenge, J. M., Campbell, W. K., & Carter, N. T. (2014). Declines in trust in others and confidence in institutions among American adults and late adolescents, 1972-2012. *Psychological Science, 25*(10), 1914-1923. https://doi.org/10.1177/0956797614545133

Twenge, J. M., & Foster, J. D. (2010). Birth Cohort Increases in Narcissistic Personality Traits Among American College Students, 1982-2009. *Social Psychological and Personality Science, 1*(1), 99-106. https://doi.org/10.1177/1948550609355719

Twenge, J. M., Konrath, S., Foster, J. D., Campbell, W. K., & Bushman, B. J. (2008). Egos inflating over time: a cross-temporal meta-analysis of the Narcissistic Personality

Inventory. *Journal of Personality, 76*(4), 875-902; discussion 903-828. https://doi.org/10.1111/j.1467-6494.2008.00507.x

Twenge, J. M., Konrath, S. H., Cooper, A. B., Foster, J. D., Keith Campbell, W., & McAllister, C. (2021). Egos deflating with the Great Recession: A cross-temporal meta-analysis and within-campus analysis of the Narcissistic Personality Inventory, 1982–2016. *Personality and Individual Differences, 179*, Article 110947. https://doi.org/10.1016/j.paid.2021.110947

Wang, J.-L., Wang, H.-Z., Gaskin, J., & Hawk, S. (2017). The mediating roles of upward social comparison and self-esteem and the moderating role of social comparison orientation in the association between social networking site usage and subjective well-being. *Frontiers in Psychology, 8*, 771. https://doi.org/10.3389/fpsyg.2017.00771

Watson, P., Grisham, S. O., Trotter, M. V., & Biderman, M. D. (1984). Narcissism and empathy: Validity evidence for the Narcissistic Personality Inventory. *Journal of Personality Assessment, 48*(3), 301-305. https://doi.org/10.1207/s15327752jpa4803_12

Wegman, L. A., Hoffman, B. J., Carter, N. T., Twenge, J. M., & Guenole, N. (2018). Placing Job Characteristics in Context: Cross-Temporal Meta-Analysis of Changes in Job Characteristics Since 1975. *Journal of Management, 44*(1), 352-386. https://doi.org/10.1177/0149206316654545

Wetzel, E., Brown, A., Hill, P. L., Chung, J. M., Robins, R. W., & Roberts, B. W. (2017). The Narcissism Epidemic Is Dead; Long Live the Narcissism Epidemic. *Psychological Science, 28*(12), 1833-1847. https://doi.org/10.1177/0956797617724208

World-Bank. (2022). *U.S. Youth Unemployment Rate 1991-2022*. 2010-2022 Macrotrends LLC. Retrieved 16.05.2022 from https://www.macrotrends.net/countries/USA/united-states/youth-unemployment-rate

Yan, Y. (2010). The Chinese path to individualization. *The British journal of sociology, 61*(3), 489-512. https://doi.org/10.1111/j.1468-4446.2010.01323.x

Register of Figures

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Register of Abbreviations

DOI	Digital Object Identifier
DSM – III	Diagnostic and Statistical Manual – third edition
GFC	Global Financial Crisis
ICD-10	International Statistical Classification of Diseases and Related Health Problems, 10th revision
ICD-11	International Statistical Classification of Diseases and Related Health Problems, 11th revision
NPD	Narcissistic Personality Disorder
NPI	Narcissistic Personality Inventory
NPI – 40	Narcissistic Personality Inventory with 40 Items
OATD	Open Access Theses and Dissertation
VIF	Variance Inflation Factor

Appendix A: Tables with all CTMAs performed

Table A1

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: U.S. student samples using the NPI-40 (Dichotomous response format); Time Frame: 1982-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = <.001; *F* (1, 360) = 1.325	362					
Year of data collection (1982-2019)			-0.017	0.014	-.066	.004	.251
Model 2: Multiple Regression	ΔR^2 = .118***; *F* (3, 238) = 13.12***	242					
Year of data collection (1982-2019)			-0.026	0.018	-.104	.009	.150
Sample Mean Age			0.031	0.107	.023	<.001	.770
Percentage of women in sample			-0.030	0.005	-.463	.125	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .004; *F* (1, 240) = 2.058	242					
Year of data collection[a] (1982-2019)			-0.026	0.018	-.099	.009	.153

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 242; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

****p* <.001.

Table A2

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: U.S. student samples using the NPI-40 (*Dichotomous response format); Time Frame: 1982-2008.*

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .005; *F* (1, 182) = 0.004	184					
Year of data collection (1982-2008)			-0.001	0.023	-.005	<.001	.952
Model 2: Multiple Regression	ΔR^2 = .121***; *F* (3, 96) = 5.939***	100					
Year of data collection (1982-2008)			0.048	0.029	.157	.026	.112
Sample Mean Age			0.037	0.138	.035	.001	.790
Percentage of women in sample			-0.025	0.006	-.429	.140	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .016; *F* (1, 98) = 2.622	100					
Year of data collection[a] (1982-2008)			0.048	0.030	.159	.026	.109

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 100; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

****p* <.001.

Table A3

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: U.S. student samples using the NPI-40 (*Dichotomous response format); Time Frame: 2009-2019.*

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .011; *F* (1, 176) = 2.887	178					
Year of data collection (2009-2019)			-0.091	0.053	-.136	.016	.091
Model 2: Multiple Regression	ΔR^2 = .105***; *F* (3, 138) = 7.718***	142					
Year of data collection (2009-2019)			-0.079	0.054	-.118	.015	.150
Sample Mean Age			-0.041	0.159	-.024	<.001	.796
Percentage of women in sample			-0.035	0.008	-.495	.119	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .007; *F* (1, 140) = 2.03	142					
Year of data collection[a] (2009-2019)			-0.075	0.053	-.129	.014	.156

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 142; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

****p* <.001.

Table A4

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: U.S. samples using any NPI format; Time Frame: 1982-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .063***; *F* (1, 697) = 47.99***	699					
Year of data collection (1982-2020)			-0.105	0.015	-.275	.064	<.001
Model 2: Multiple Regression	ΔR^2 = .450***; *F* (6, 502) =84.61***	509					
Year of data collection (1982-2020)			-0.026	0.015	-.069	.006	.079
Sample Mean Age			-0.107	0.019	-.268	.062	<.001
Percentage of women in sample			-0.026	0.004	-.242	.069	<.001
Scale (0= dichotomous)			6.132	0.375	.474	.347	<.001
Items			0.101	0.009	.352	.214	<.001
Sample (0 = students)			-0.598	0.288	-.081	.008	.039
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .003; *F* (1, 507) = 2.685	509					
Year of data collection[a] (1982-2020)			-0.023	0.014	.076	.005	.102

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 509; Variance Inflation Factors (VIFs) in multiple Regression are all <2.5.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

****p* <.001.

Table A5

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: U.S. samples using any NPI format; Time Frame: 1982-2008.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .011*; *F* (1, 281) = 4.137*	283					
Year of data collection (1982-2008)			0.042	0.021	.117	.015	.043
Model 2: Multiple Regression	ΔR^2 = .193***; *F* (6, 156) = 10.41***	163					
Year of data collection (1982-2008)			0.089	0.026	.248	.068	.001
Sample Mean Age			-0.120	0.045	-.315	.044	.009
Percentage of women in sample			-0.018	0.005	-.237	.063	.001
Scale (0= dichotomous)			4.421	1.013	.271	.108	<.001
Items			0.009	0.032	.025	<.001	.787
Sample (0 = students)			0.079	0.570	.009	<.001	.889
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .045**; *F* (1, 161) = 8.702**	163					
Year of data collection[a] (1982-2008			0.067	0.023	.227	.051	.004

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 163; Variance Inflation Factors (VIFs) in multiple Regression are all <2.4.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

* *p* <.05; ** *p* <.01; ***p <.001.

Table A6

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: U.S. samples using any NPI format; Time Frame: 2009-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .063***; *F* (1, 414) = 28.77***	416					
Year of data collection (2009-2020)			-0.293	0.055	-.247	.065	<.001
Model 2: Multiple Regression	ΔR^2 = .511***; *F* (6, 339) = 70.04***	346					
Year of data collection (2009-2020)			-0.096	0.040	-.081	.017	.015
Sample Mean Age			-0.117	0.020	-.285	.088	<.001
Percentage of women in sample			-0.031	0.006	-.238	.078	<.001
Scale (0= dichotomous)			6.339	0.401	.531	.424	<.001
Items			0.107	0.009	.363	.287	<.001
Sample (0 = students)			-0.542	0.334	-.074	.008	.101
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .003*; *F* (1, 220) = 1.598*	346					
Year of data collection[a] (2009-2020)			-0.086	0.037	-.113	.015	.021

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 346; Variance Inflation Factors (VIFs) in multiple Regression are all <2.5.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

* *p* <.05; ***p* <.001.

Table A7

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: student samples using the NPI-40 (Dichotomous response format); Time Frame: 1982-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .028***; *F* (1, 509) = 14.67***	511					
Year of data collection (1982-2019)			-0.052	0.013	-.174	.028	<.001
Model 2: Multiple Regression	ΔR^2 = .113***; *F* (3, 377) = 23.11***	381					
Year of data collection (1982-2019)			-0.057	0.017	-.192	.030	.001
Sample Mean Age			-0.153	0.052	-.142	.023	.003
Percentage of women in sample			-0.028	0.004	-.407	.102	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .027***; *F* (1, 379) = 11.44***	381					
Year of data collection[a] (1982-2019)			-0.056	0.017	-.180	.029	.001

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 381; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

****p* <.001.

Table A8

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: student samples using the NPI-40 (Dichotomous response format); Time Frame: 1982-2008.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = <.001; *F* (1, 218) = 0.336	220					
Year of data collection (1982-2008)			0.013	0.022	-.040	.002	.562
Model 2: Multiple Regression	ΔR^2 = .126***; *F* (3, 132) = 8.749***	136					
Year of data collection (1982-2008)			0.058	0.027	.180	.034	.032
Sample Mean Age			-0.153	0.104	-.150	.016	.142
Percentage of women in sample			-0.024	0.006	-.415	.126	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .027*; *F* (1, 134) = 4.77*	136					
Year of data collection[a] (1982-2008)			0.057	0.026	.182	.034	.031

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 136; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

* *p* <.05; ***p* <.001.

Table A9

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: student samples using the NPI-40 (Dichotomous response format); Time Frame: 2009-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .035***; *F* (1, 289) = 11.55***	291					
Year of data collection (2009-2019)			-0.156	0.046	-.199	.038	<.001
Model 2: Multiple Regression	ΔR^2 = .100***; *F* (3, 241) = 14.27***	245					
Year of data collection (2009-2019)			-0.138	0.048	-.175	.032	.005
Sample Mean Age			-0.143	0.060	-.131	.023	.019
Percentage of women in sample			-0.030	0.006	-.391	.093	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .027**; *F* (1, 134) = 4.77**	245					
Year of data collection[a] (2009-2019)			-0.135	0.048	-.184	.032	.005

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 245; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

** *p* <.01; ***p* <.001.

Table A10

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: all samples; Time Frame: 1982-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .038***; *F* (1, 1431) = 56.87***	1433					
Year of data collection (1982-2020)			-0.119	0.016	-.235	.038	<.001
Model 2: Multiple Regression	ΔR^2 = .510***; *F* (6, 1172) = 246***	1179					
Year of data collection (1982-2020)			-0.047	0.015	-.092	.008	.002
Sample Mean Age			-0.068	0.012	-.154	.026	<.001
Percentage of women in sample			-0.023	0.003	-.187	.057	<.001
Scale (0= dichotomous)			5.838	0.176	.545	.485	<.001
Items			0.084	0.007	.264	.120	<.001
Sample (0 = students)			-0.641	0.208	-.085	.008	.002
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .006**; *F* (1, 1177) = 8.558**	1179					
Year of data collection[a] (1982-2020)			-0.040	0.014	-.093	.007	.004

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 1179; Variance Inflation Factors (VIFs) in multiple Regression are all <2.2.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

** *p* <.01; ***p* <.001.

Table A11

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: all samples using any NPI format; Time Frame: 1982-2008.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = <.001; *F* (1, 385) = 28.77	387					
Year of data collection (1982-2008)			0.019	0.022	.046	.007	.387
Model 2: Multiple Regression	ΔR^2 = .203***; *F* (6, 246) = 13***	253					
Year of data collection (1982-2008)			0.084	0.026	.200	.040	.001
Sample Mean Age			-0.110	0.034	-.293	.041	.001
Percentage of women in sample			-0.015	0.005	-.185	.034	.003
Scale (0= dichotomous)			2.117	0.573	.198	.053	<.001
Items			0.041	0.025	.107	.010	.111
Sample (0 = students)			-0.717	0.539	-.102	.007	.185
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .030**; *F* (1, 251) = 8.706**	253					
Year of data collection[a] (1982-2008)			0.070	0.024	.178	.034	.003

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 253; Variance Inflation Factors (VIFs) in multiple Regression are all <2.5.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

** *p* <.01; ***p* <.001.

Table A12

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: all samples using any NPI format; Time Frame: 2009-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .094***; *F* (1, 1044) = 109.4***	1046					
Year of data collection (2009-2020)			-0.409	0.039	-.247	.095	<.001
Model 2: Multiple Regression	ΔR^2 = .493***; *F* (6, 919) = 227***	926					
Year of data collection (2009-2020)			-0.078	0.029	-.057	.008	.003
Sample Mean Age			-0.058	0.013	-.126	.021	<.001
Percentage of women in sample			-0.024	0.006	-.175	.061	<.001
Scale (0= dichotomous)			6.004	0.196	.566	.506	<.001
Items			0.085	0.007	.258	.136	<.001
Sample (0 = students)			-0.744	0.231	-.095	.011	.101
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .006*; *F* (1, 924) = 6.302*	926					
Year of data collection[a] (2009-2020)			-0.068	0.037	-.069	.007	.012

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 926; Variance Inflation Factors (VIFs) in multiple Regression are all <2.1.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

* *p* <.05; ***p* <.001.

Table A13

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: European student samples using the NPI-40 (Dichotomous response format); Time Frame: 1997-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = <.001; *F* (1, 52) = 0.647	54					
Year of data collection (1997-2019)			-0.053	0.066	-.103	.012	.425
Model 2: Multiple Regression	ΔR^2 = .026; *F* (3, 46) = 1.443	50					
Year of data collection (1997-2019)			-0.062	0.067	-.121	.018	.362
Sample Mean Age			-0.003	0.076	-.005	<.001	.965
Percentage of women in sample			-0.021	0.011	-.317	.072	.064
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .027; *F* (1, 134) = 4.77	50					
Year of data collection[a] (1997-2019)			-0.062	0.066	-.125	.018	.352

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 50; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

****p* <.001.

Table A14

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: European student samples using the NPI-40 (*Dichotomous response format); Time Frame: 2009-2019.*

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .064; *F* (1, 43) = 3.989	45					
Year of data collection (2009-2019)			-0.246	0.123	-.291	.085	.052
Model 2: Multiple Regression	ΔR^2 = .003; *F* (3, 37) = 2.559	41					
Year of data collection (2009-2019)			-0.305	0.141	-.360	.112	.037
Sample Mean Age			0.039	0.084	-.058	.006	.644
Percentage of women in sample			-0.021	0.012	-.314	.079	.084
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .084*; *F* (1, 39) = 4.653*	41					
Year of data collection[a] (2009-2019)			-0.289	0.134	-.320	.107	.037

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 41; Variance Inflation Factors (VIFs) in multiple Regression are all <1.2.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

* *p* <.05

Table A15

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: European samples using any NPI format; Time Frame: 1988-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = <.001; *F* (1, 351) = 0.063	353					
Year of data collection (1988-2020)			-0.015	0.058	-.017	<.001	.801
Model 2: Multiple Regression	ΔR^2 = .555***; *F* (6, 317) = 70.85***	324					
Year of data collection (1988-2020)			-0.081	0.046	-.094	.010	.076
Sample Mean Age			-0.092	0.022	-.199	.052	<.001
Percentage of women in sample			-0.026	0.006	-.204	.060	<.001
Scale (0= dichotomous)			5.747	0.304	.622	.530	<.001
Items			0.056	0.013	.163	.052	<.001
Sample (0 = students)			0.424	0.402	.052	.004	.292
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .006; *F* (1, 324) = 3.04	324					
Year of data collection[a] (1988-2020)			-0.077	0.044	-.107	.009	.082

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 324; Variance Inflation Factors (VIFs) in multiple Regression are all <2.1.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

****p* <.001.

Table A16

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: European samples using any NPI format; Time Frame: 1988-2008.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = <.001; *F* (1, 41) = 0.813	43					
Year of data collection (1988-2008)			-0.135	0.150	-.183	.019	.373
Model 2: Multiple Regression	ΔR^2 = .295**; *F* (6, 27) = 3.302**	34					
Year of data collection (1988-2008)			-0.117	0.136	-.158	.027	.395
Sample Mean Age			-0.070	0.070	-.210	.036	.326
Percentage of women in sample			-0.002	0.016	-.026	.001	.882
Scale (0= dichotomous)			3.331	1.028	.514	.280	.003
Items			0.030	0.063	.092	.008	.639
Sample (0 = students)			-0.235	1.618	-0.038	.001	.886
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = <.001; *F* (1, 32) = 0.761	34					
Year of data collection[a] (1988-2008)			-0.101	0.116	-.141	.023	.390

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 34; Variance Inflation Factors (VIFs) in multiple Regression are all <3.7.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

**p <.01.

Table A17

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: European samples using any NPI format; Time Frame: 2009-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .030**; *F* (1, 308) = 10.45**	310					
Year of data collection (2009-2020)			-0.307	0.095	-.202	.033	.001
Model 2: Multiple Regression	ΔR^2 = .563***; *F* (6, 283) = 76.76***	290					
Year of data collection (2009-2020)			-0.300	0.064	-.197	.072	<.001
Sample Mean Age			-0.089	0.022	-.189	.053	<.001
Percentage of women in sample			-0.028	0.006	-.211	.075	<.001
Scale (0= dichotomous)			5.830	0.312	.604	.553	<.001
Items			0.075	0.014	.212	.093	<.001
Sample (0 = students)			0.229	0.410	0.027	.001	.576
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .065***; *F* (1, 288) = 21.02***	290					
Year of data collection[a] (2009-2020)			-0.283	0.062	-.257	.068	<.001

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 290; Variance Inflation Factors (VIFs) in multiple Regression are all <2.1.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

**p <.01; ***p <.001.

Table A18

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: Asian student samples using the NPI-40 (Dichotomous response format); Time Frame: 1992-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .004; *F* (1, 22) = 1.101	24					
Year of data collection (1992-2019)			-0.068	0.065	-.224	.048	.306
Model 2: Multiple Regression	ΔR^2 = .195*; *F* (3, 18) = 2.697*	22					
Year of data collection (1992-2019)			-0.106	0.071	-.349	.108	.157
Sample Mean Age			0.765	0.309	.682	.254	.024
Percentage of women in sample			-0.010	0.015	-.1615	.026	.498
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .050; *F* (1, 20) = 2.113	22					
Year of data collection[a] (1992-2019)			-0.093	0.064	-.335	.096	.162

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 22; Variance Inflation Factors (VIFs) in multiple Regression are all <1.3.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

*p <.05

Table A19

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: Asian samples using any NPI format; Time Frame: 1992-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .011; *F* (1, 131) = 2.498	133					
Year of data collection (1992-2020)			-0.150	0.095	-.177	.019	.116
Model 2: Multiple Regression	ΔR^2 = .473***; *F* (6, 107) = 19.88***	114					
Year of data collection (1992-2020)			0.117	0.096	.138	.014	.225
Sample Mean Age			0.092	0.063	.167	.020	.144
Percentage of women in sample			-0.016	0.007	-.119	.055	.015
Scale (0= dichotomous)			6.324	0.714	.633	.423	<.001
Items			0.016	0.038	.040	.002	.678
Sample (0 = students)			-0.070	0.920	.007	<.001	.939
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 =<.001; *F* (1,112) = 0.895	114					
Year of data collection[a] (1992-2020)			0.068	0.072	.102	.008	.346

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 114; Variance Inflation Factors (VIFs) in multiple Regression are all <2.2.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

****p* <.001.

Table A20

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: Asian samples using any NPI format; Time Frame: 1992-2008.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = <.001; *F* (1, 20) = 0.184	22					
Year of data collection (1992-2008)			0.090	0.210	.116	.009	.672
Model 2: Multiple Regression	ΔR^2 = .403* *F* (6, 13) = 3.139*	20					
Year of data collection (1992-2008)			0.152	0.176	.196	.054	.404
Sample Mean Age			0.381	0.243	.809	.160	.140
Percentage of women in sample			-0.006	0.025	-.057	.005	.812
Scale (0= dichotomous)			8.371	3.886	.717	.263	.051
Items			0.274	0.605	.140	.016	.658
Sample (0 = students)			-11.019	4.494	-1.224	.316	.029
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 =<.001; *F* (1,18) = 0.927	20					
Year of data collection[a] (1992-2008)			0.138	0.143	.177	.049	.348

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 20; Variance Inflation Factors (VIFs) in multiple Regression are all <5.7.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

*p <.05.

Table A21

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: Asian samples using any NPI format; Time Frame: 2009-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .068**; *F* (1, 109) = 9.08**	111					
Year of data collection (2009-2020)			-0.358	0.119	-.219	.077	.003
Model 2: Multiple Regression	ΔR^2 = .413*** *F* (6, 87) = 3.139***	94					
Year of data collection (2009-2020)			0.235	0.154	.144	.026	.131
Sample Mean Age			0.089	0.073	.154	.017	.228
Percentage of women in sample			-0.016	0.007	-.110	.059	.022
Scale (0= dichotomous)			6.477	0.822	.657	.416	<.001
Items			0.022	0.041	.054	.003	.597
Sample (0 = students)			0.739	1.024	.077	.006	.472
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 =<.001; *F* (1,92) = 0.858	94					
Year of data collection[a] (2009-2020)			0.084	0.090	.067	.009	.357

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 94; Variance Inflation Factors (VIFs) in multiple Regression are all <5.7.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

**p <.0; ***p <.001.

Table A22

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: Australian samples using any NPI format; Time Frame: 1992-2018.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .051; *F* (1, 48) = 3.658	50					
Year of data collection (2009-2020)			-0.253	0.132	-.327	.071	.062
Model 2: Multiple Regression	ΔR^2 = .622*** *F* (6, 40) = 16.37***	47					
Year of data collection (2009-2020)			-0.042	0.088	-.055	.006	.634
Sample Mean Age			-0.132	0.090	-.274	.050	.153
Percentage of women in sample			-0.011	0.018	-.086	.008	.558
Scale (0= dichotomous)			4.814	1.059	.349	.341	<.001
Items			0.241	0.035	.666	.550	<.001
Sample (0 = students)			-0.260	1.103	-.031	.001	0.815
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 =<.001; *F* (1,45) = 0.207	47					
Year of data collection[a] (2009-2020)			-0.034	0.075	-.072	.005	.652

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 94; Variance Inflation Factors (VIFs) in multiple Regression are all <2.9.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

****p* <.001.

Table A23

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: Australian samples using any NPI format; Time Frame: 2009-2018.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .052; *F* (1, 40) = 3.25	42					
Year of data collection (2009-2020)			-0.418	0.232	-.290	.075	.079
Model 2: Multiple Regression	ΔR^2 = .639*** *F* (6, 32) = 14.56***	39					
Year of data collection (2009-2020)			-0.041	0.163	-.028	.002	.805
Sample Mean Age			-0.124	0.093	-.266	.052	.194
Percentage of women in sample			-0.010	0.020	-.073	.007	.642
Scale (0= dichotomous)			4.96	1.110	.383	.384	<.001
Items			0.238	0.038	.655	.551	<.001
Sample (0 = students)			-0.016	1.178	-.002	<.001	.989
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 =<.001; *F* (1,37) = 0.052	39					
Year of data collection[a] (2009-2020)			-0.029	0.129	-.033	.001	0.821

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 94; Variance Inflation Factors (VIFs) in multiple Regression are all <2.7.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

****p* <.001.

Table A24

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: North American student samples using the NPI-40 (Dichotomous response format); Time Frame: 1982-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .008*; *F* (1, 419) = 4.244*	421					
Year of data collection (1982-2019)			-0.028	0.014	-.106	.010	.040
Model 2: Multiple Regression	ΔR^2 = .127***; *F* (3, 294) = 18.39***	298					
Year of data collection (1982-2019)			-0.037	0.017	-.139	.016	.029
Sample Mean Age			-0.002	0.098	.001	<.001	.984
Percentage of women in sample			-0.031	0.004	-.472	.135	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = <.001*; *F* (1, 11) = 0.084*	298					
Year of data collection[a] (1982-2019)			-0.036	0.016	-.130	.016	.032

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 298; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

*p <.05; ***p <.001.

Table A25

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: North American student samples using the NPI-40 (Dichotomous response format); Time Frame: 1982-2008.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 =<.001; *F* (1, 195) = 0.096	197					
Year of data collection (1982-2008)			0.007	0.023	.023	<.001	.757
Model 2: Multiple Regression	ΔR^2 = .127***; *F* (3, 109) = 7.325***	113					
Year of data collection (1982-2008)			0.054	0.027	.179	.034	.051
Sample Mean Age			0.010	0.129	.010	<.001	.936
Percentage of women in sample			-0.025	0.006	-.444	.145	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .026; *F* (1, 111) = 3.946	113					
Year of data collection[a] (1982-2008)			0.054	0.027	.130	.016	.050

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 113; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

****p* <.001.

Table A26

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: North American student samples using the NPI-40 (Dichotomous response format); Time Frame: 2009-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .016*; *F* (1, 222) = 4.549*	224					
Year of data collection (2009-2019)			-0.104	0.049	-.145	.020	.034
Model 2: Multiple Regression	ΔR^2 = .124***; *F* (3, 181) = 11.41***	185					
Year of data collection (2009-2019)			-0.086	0.049	-.120	.017	.083
Sample Mean Age			-0.087	0.139	-.050	.002	.533
Percentage of women in sample			-0.036	0.007	-.496	.136	<.001
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .026; *F* (1, 111) = 3.946	185					
Year of data collection[a] (2009-2019)			-0.081	0.048	-.129	.016	.090

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 185; Variance Inflation Factors (VIFs) in multiple Regression are all <1.1.

[a] Adjusted for confounding variables (Percentage of women in sample & Sample mean age).

*p <.05; ***p <.001.

Table A27

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: North American samples using any NPI format; Time Frame: 1982-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .067***; *F* (1, 808) = 59.5***	810					
Year of data collection (1982-2020)			-0.112	0.014	-.283	.069	<.001
Model 2: Multiple Regression	ΔR^2 = .453***; *F* (6, 605) = 105.2***	612					
Year of data collection (1982-2020)			-0.034	0.014	-.085	.009	.018
Sample Mean Age			-0.102	0.017	-.251	.056	<.001
Percentage of women in sample			-0.026	0.004	-.243	.071	<.001
Scale (0= dichotomous)			6.032	0.332	.485	.353	<.001
Items			0.107	0.008	.366	.221	<.001
Sample (0 = students)			-0.394	0.278	-.053	.003	.157
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .006*; *F* (1,610) = 4.789*	612					
Year of data collection[a] (1982-2020)			-0.029	0.013	-.090	.008	.029

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 612; Variance Inflation Factors (VIFs) in multiple Regression are all <2.6.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

*p <.05; ***p <.001.

Table A28

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: North American samples using any NPI format; Time Frame: 1982-2008.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .015*; *F* (1, 307) = 5.68*	309					
Year of data collection (1982-2008)			0.047	0.020	.131	.018	.018
Model 2: Multiple Regression	ΔR^2 = .154***; *F* (6, 179) = 9.817***	186					
Year of data collection (1982-2008)			0.101	0.025	.278	.083	<.001
Sample Mean Age			-0.095	0.042	-.253	.029	.023
Percentage of women in sample			-0.018	0.005	-.247	.066	<.001
Scale (0= dichotomous)			2.749	0.752	.210	.070	<.001
Items			0.023	0.029	.066	.003	.434
Sample (0 = students)			-0.049	0.566	-.006	<.001	.931
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .062***; *F* (1,184) = 13.16***	186					
Year of data collection[a] (1982-2008)			0.081	0.022	.262	.067	<.001

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 186; Variance Inflation Factors (VIFs) in multiple Regression are all <2.6.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

*p <.05; ***p <.001.

Table A29

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: North American samples using any NPI format; Time Frame: 2009-2020.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .062***; *F* (1, 499) = 33.8***	501					
Year of data collection (2009-2020)			-0.289	0.050	-.243	.063	<.001
Model 2: Multiple Regression	ΔR^2 = .533***; *F* (6, 419) = 95.58***	426					
Year of data collection (2009-2020)			-0.109	0.035	-.092	.023	.002
Sample Mean Age			-0.110	0.018	-.267	.082	<.001
Percentage of women in sample			-0.030	0.005	-.236	.082	<.001
Scale (0= dichotomous)			6.488	0.358	.543	.439	<.001
Items			0.110	0.008	.375	.291	<.001
Sample (0 = students)			-0.304	0.311	-.041	.002	.328
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .018**; *F* (1,424) = 8.901**	426					
Year of data collection[a] (2009-2020)			-0.099	0.033	-.127	.021	.003

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2= partial eta squared; changes in R^2 between models 1 and 2 were based on k = 426; Variance Inflation Factors (VIFs) in multiple Regression are all <2.7.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

**p <.01; ***p <.001.

Table A30

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: German Speaking samples using any NPI format; Time Frame: 1999-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .047*; *F* (1, 104) = 6.035*	104					
Year of data collection (1999-2019)			-0.158	0.064	-.246	.056	.016
Model 2: Multiple Regression	ΔR^2 = .418***; *F* (6, 88) = 18.93***	95					
Year of data collection (1999-2019)			-0.171	0.062	-.265	.080	.007
Sample Mean Age			0.021	0.044	.0450	.003	.624
Percentage of women in sample			-0.028	0.010	-.233	.082	.006
Scale (0= dichotomous)			3.643	0.605	.440	.292	<.001
Items			0.057	0.019	.215	.092	.004
Sample (0 = students)			0.394	0.587	.057	.005	.504
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .058*; *F* (1, 93) = 6.829*	95					
Year of data collection[a] (1999-2019)			-0.146	0.056	-.255	.068	.011

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 95; Variance Inflation Factors (VIFs) in multiple Regression are all <3.5.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

*p <.05; ***p <.001.

Table A31

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: German Speaking samples using any NPI format; Time Frame: 2009-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .217***; *F* (1, 86) = 25.16***	88					
Year of data collection (2009-2019)			-0.544	0.108	-.464	.226	<.001
Model 2: Multiple Regression	ΔR^2 = .345***; *F* (6, 75) = 33.98***	82					
Year of data collection (2009-2019)			-0.391	0.092	-.333	.194	<.001
Sample Mean Age			0.019	0.044	.040	.002	.669
Percentage of women in sample			-0.030	0.010	-.241	.102	.005
Scale (0= dichotomous)			3.267	0.633	.364	.262	<.001
Items			0.062	0.020	.228	.115	.003
Sample (0 = students)			0.457	0.608	.062	.007	.455
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .156***; *F* (1, 80) = 15.97***	82					
Year of data collection[a] (2009-2019)			-0.335	0.084	-.327	.166	<.001

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 82; Variance Inflation Factors (VIFs) in multiple Regression are all <3.5.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Scale, Items & Sample).

****p* <.001.

Table A32

Interaction Model: Parameters of multiple linear weighted meta-regression on mean NPI scores; Sub-Sample: U.S. students using the NPI-40 (*Dichotomous response format); Time Frame: 1982-2019.*.

Predictors	Model fit	*k*	*b*	*SE*	η_p^2	*p*
Interaction Model	R^2 = .147***; *F* (4, 237) = 11.35***	242				
Year of data collection (1982-2019)			-0.070	0.045	.009	.125
Sample Mean Age			0.020	0.106	<.001	.849
Percentage of women in sample			3.234	1.414	.127	.023
Year of data collection x Percentage of Women in Sample			-0.002	0.001	.022	.022

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; η_p^2 = partial eta squared.

****p* <.001.

Table A33

Interaction Model: Parameters of multiple linear weighted meta-regression on mean NPI scores Sub-Sample: all samples; Time Frame: 1982-2020.

Predictors	Model fit	*k*	*b*	*SE*	η_p^2	*p*
Interaction Model	ΔR^2 = .559***; *F* (7, 1171) = 213.9***	1179				
Year of data collection (1982-2020)			0.042	0.032	.009	.187
Sample Mean Age			-0.071	0.012	.028	<.001
Percentage of women in sample			2.989	0.956	.057	.002
Scale (0= dichotomous)			5.853	0.175	.488	<.001
Items			0.084	0.007	.120	<.001
Sample (0 = students)			-0.656	0.207	.008	.002
Year of data collection x Percentage of Women in Sample			-0.001	<.001	.008	.002

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; η_p^2 = partial eta squared.

****p* <.001.

Table A34

Parameters of single, multiple linear weighted meta-regression and semi-partial correlation on mean NPI scores; Sub-Sample: German Speaking samples using the NPI-40 (Dichotomous response format); Time Frame: 2002-2019.

Predictors	Model fit	*k*	*b*	*SE*	β	η_p^2	*p*
Model 1: Single Regression	R^2 = .082*; *F* (1, 50) = 5.554*	52					
Year of data collection (*2002*-2019)			-0.161	0.068	-.296	.100	.022
Model 2: Multiple Regression	ΔR^2 = .150*; *F* (4, 41) = 4.419*	46					
Year of data collection (*2002*-2019)			-0.217	0.075	-.400	.171	.006
Sample Mean Age			-0.074	0.069	-.169	.027	.289
Percentage of women in sample			-0.050	0.017	-.639	.182	.004
Sample (0 = students)			1.512	0.687	.310	.106	.033
	Model 3: Mean NPI Scores adjusted for confounding variables						
Semi-partial correlation	R^2 = .124*; *F* (1, 44) = 7.347*	46					
Year of data collection[a] (*2002*-2019)			-0.181	0.067	-.363	.143	.010

Note. Variables were weighted based on sample size; all R^2 are adjusted values; *k* = number of samples; *b* = unstandardized regression coefficient; *SE* = standard error of unstandardized coefficient; β = standardized regression coefficient; η_p^2 = partial eta squared; changes in R^2 between models 1 and 2 were based on k = 46; Variance Inflation Factors (VIFs) in multiple Regression are all <1.5.

[a] Adjusted for confounding variables (Percentage of women in sample, Sample mean age, Sample).

*p <.050.

Appendix B: Abstract in English

Positive time trends in narcissism have been shown among students in the USA. However, the debate about a rise in narcissistic tendencies is controversial. Time trends in narcissism with data outside the USA are scarce, and recent findings suggest a decline in narcissism since the Global Financial Crisis (GFC) in 2008. This study examined time trends in narcissism in a worldwide and comprehensive way. Time trends in narcissism were analyzed for North America (USA), Europe (German-speaking region), Asia, and Australia. The time trends in narcissism were analyzed using a Cross-Temporal Meta-Analysis. First, the mean scores of the widely used Narcissistic Personality Inventory (NPI) were analyzed in terms of a trend in the period from 1982 to 2020. Second, analyses were conducted for the period before the peak of the GFC in 2008 and afterward, to address the question of a reversal of trends in narcissism due to the GFC. Third, time trends in narcissism were analyzed as a function of sex. In summary, no positive trend was found in the USA among students. Meaningful decreases in narcissistic tendencies were evident in a worldwide analysis and in several regional analyses (North America, Europe, and German-speaking regions). The GFC showed to be insufficient in explaining changes in the pattern of time trends in narcissism. Unexpectedly, the findings of this study indicated, that narcissistic tendencies among women significantly decreased over time, while the tendencies of men did not change over time. Several causes are discussed in relation to decreases in narcissistic tendencies.

Keywords: Narcissism, Narcissistic Personality Inventory, Time Trends, Cross-Temporal Meta-Analysis

Appendix C: Abstract in German

Bei Studierenden in den USA wurden positive zeitliche Trends im Narzissmus festgestellt. Die Debatte über einen Anstieg narzisstischer Tendenzen ist umstritten. Zeitliche Trends im Narzissmus mit Daten außerhalb der USA sind rar und jüngste Ergebnisse deuten auf einen Rückgang des Narzissmus seit der globalen Finanzkrise (GFC) im Jahr 2008 hin. Diese Studie untersuchte die zeitliche Entwicklung des Narzissmus in einer weltweiten und umfassenden Weise. Die zeitliche Entwicklung des Narzissmus wurde für Nordamerika (USA), Europa (deutschsprachiger Raum), Asien und Australien analysiert. Die zeitliche Entwicklung des Narzissmus wurde mittels einer cross-temporalen Meta-Analyse analysiert. Zum einen wurden die Mittelwerte des verbreiteten Narcissistic Personality Inventory (NPI) im Hinblick auf einen Trend im Zeitraum von 1982 bis 2020 analysiert. Zweitens, um die Frage nach einer Trendumkehr im Narzissmus aufgrund der Weltwirtschaftskrise zu beantworten, wurden Analysen für den Zeitraum vor dem Höhepunkt der Weltwirtschaftskrise im Jahr 2008 und danach durchgeführt. Drittens wurden die zeitlichen Trends im Narzissmus in Abhängigkeit vom Geschlecht analysiert. Zusammenfassend zeigte sich, dass in den USA bei Studierenden kein positiver Trend festgestellt werden konnte. Bedeutsame Rückgänge narzisstischer Tendenzen wurden in einer weltweiten Analyse und in mehreren regionalen Analysen (Nordamerika, Europa und deutschsprachiger Raum) festgestellt. Die GFC erwies sich als unzureichende Begründung, um Veränderungen im Muster der zeitlichen Trends im Narzissmus zu erklären. Unerwarteterweise zeigten die Ergebnisse dieser Studie, dass narzisstische Tendenzen bei Frauen im Laufe der Zeit signifikant abnahmen, während sich die Tendenzen bei Männern im Laufe der Zeit nicht veränderten. Im Zusammenhang mit dem Rückgang der narzisstischen Tendenzen werden mehrere Ursachen diskutiert.

Schlagwörter: Narzissmus, Narzisstisches Persönlichkeitsinventar, Zeitliche Trends, Cross-Temporale Meta-Analyse