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Birth Cohort Differences

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# Birth Cohort Differences in the Monitoring the Future Dataset and Elsewhere

## Further Evidence for Generation Me—Commentary on Trzesniewski & Donnellan (2010)

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## Abstract

A substantial majority of published studies have reported increases of individualism and materialism and declines in mental health and interpersonal trust over generations. The data Trzesniewski and Donnellan (2010, this issue) present from the Monitoring the Future (MTF) survey of high-school students is almost entirely consistent with these previous findings, showing decreases in civic interest and trust and increases in high expectations, materialism, and self-satisfaction. Problems with measurement and variable labeling explain the few seeming discrepancies. They analyze only 15% of the variables in MTF, ignoring many others that also demonstrate increases in individualistic traits. Ecological correlations are not an issue in previous studies as the individual-level standard deviation is used to compute effect sizes. Increases in

narcissism are clear when important moderator variables (e.g., campus) are controlled. The real puzzle is why these authors' conclusions fall so far from the data.

Keywords: culture, birth cohort differences, generations, individualism, measurement

*The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down what seemed to be a very deep well.*

—Carroll (1865, p. 3)

We feel a bit like Alice, who fell down a rabbit hole into a nonsensical world, as we are utterly perplexed by this debate. There is no doubt American culture has changed significantly in the last few decades, and a large number of studies have documented a substantial rise in individualistic traits/attitudes and mental health problems and a decline in interpersonal trust over the generations (e.g., Alwin, 1996; Dey, Astin, & Korn, 2007; Goodwin, 2003; Gough, 1991; Kessler et al., 2005; Lewinsohn, Rohde, Seeley, & Fischer, 1993; Reynolds, Stewart, MacDonald, & Sischo, 2006; Robinson & Jackson, 2001; Scollon & Diener, 2006; Thornton & Young-DeMarco, 2001). Shifts in behavior show similar trends: Fewer people join community groups (Putnam, 2000); 10% of Americans are using antidepressant medications, which is double the number in 1996 (Olfson & Marcus, 2009); and plastic surgery rates have doubled in just 10 years (see Twenge & Campbell, 2009, for a review; see also Table 1). The focus on individual rights has also led to opportunities for women and racial minorities: for example, 16 times as

many law degrees go to women now than in 1960, and four times as many African-Americans obtain at least a high school education now than they did in 1960 (U.S. Census, 2009).

Yet Trzesniewski and Donnellan (2010, this issue) conclude that there are no generational differences, solely on the basis of less than 15% of the variables from one dataset, 95% of which actually show statistically significant change at $p < .001$. This is similar to concluding there are no black swans after selecting a small portion of a single lake, identifying a large number of dark-colored swans, and then writing them off as "muddy." And what does the Monitoring the Future (MTF) dataset—even their selected small portion of it—show? As Figure 1 illustrates, MTF finds that today's teens have unrealistically high expectations, place more value on money, are more supportive of "doing your own thing," trust others less, think they are more intelligent than their peers, and express less interest in government affairs—all of which are consistent with the theme of a more individualistic generation ("Generation Me") found in our research (e.g., Twenge, 2006). Trzesniewski and Donnellan say they wish to replicate the profile of Generation Me described in previous literature, and they do. Without the introduction and discussion of their article, we could easily cite it in support of our previous findings. Seeming discrepancies (e.g., self-enhancement, self-esteem) are easily explained by serious measurement issues. And despite Trzesniewski and Donnellan's critique of our cross-temporal meta-analyses (CTMAs, which gather questionnaire responses from same-age respondents over time), exactly none of their results directly contradict them (see below on self-esteem; the locus-of-control CTMA used a different measure and did not include high-school samples; Twenge, Zhang, & Im, 2004). They also extensively critique CTMAs for using ecological correlations, but then finally, and correctly, admit that CTMAs do not use ecological correlations to compute effect sizes. It should also be noted that CTMAs, like MTF, use same-age samples from different

times, so the differences must be due to generation or time period and cannot be due to age or developmental stage.

## THE (IL)LOGIC OF TRZESNIEWSKI AND DONNELLAN'S ARGUMENT

Trzesniewski and Donnellan argue that previous studies finding generational differences are wrong (though they only critique CTMAs and ignore the many other studies by other authors, cited above, showing generational differences). They base this null prediction on the idea that older members of society see change where none exists, but provide no data on how older people perceive the young generation (other than a quote of uncertain origin), leaving their small amount of theory completely unsupported. In fact, the little data available on cross-generational perceptions contradicts their claim: Young people themselves are just as likely to view their generation negatively as older people are, and the oldest are the least negative toward the youngest (Harris Poll, 2008). Trzesniewski and Donnellan provide no theoretical model on why cultural changes have not been accompanied by changes in individuals. Either culture hasn't changed or the self isn't linked to culture, but they provide no insight one way or the other.

To test their predicted null model, they set up the following:

H0: There is no change in individuals

H1: There is change in individuals

They then choose a significance level considerably less than $p < .0001$ (the $p$ value is likely much smaller than this, and it changes depending on the $n$, but we were unable to confirm the exact level as statistical tables list $p$ values only to $p < .0001$). In other words, unless they are considerably more than 99.9999% confident in the observed change, they do not acknowledge any change. This is a consequence of their arbitrary cutoff of $d = .20$, which equates a $d$ of |.19| to a $d$ of .00 despite strong statistical significance. They then identify approximately 15% ($N =$

135) of the items in a large database, ignoring many other relevant variables (for five examples, see Twenge & Campbell, 2008; for three more, see Table 1; in addition, they examine an item on the importance of religion but not the item immediately preceding it on attending religious services, which—perhaps not coincidentally—shows a doubling of those who never attend services: 10% in the mid-1970s vs. 20% in 2007).

They then conducted their analysis. Ninety-five percent of the items they examined have changed (consistent with H1), but "only" at *p* values ranging from .01 to less than .0001. Thus, they conclude there has been no change, and they use this conclusion to critique CTMA.

We have a few concerns with Trzesniewski and Donnellan's approach.

## SPECIFIC ISSUES WITH TRZESNIEWSKI AND DONNELLAN'S APPROACH

### Measurement Issues and Item Labeling

Trzesniewski and Donnellan's measure of "self-enhancement" uses self-reported grades rather than an objective measure (e.g., actual grades), as most self-enhancement measures do (Paulhus & Williams, 2002). They report that self-reported grades correlate .82 with actual grades, but (a) correlation tells us nothing about level and (b) that still leaves 33% of the variance explained by students misreporting grades—possibly the same students who exaggerate their intelligence. The self-esteem and locus-of-control items in MTF have serious measurement issues, as they were interspersed with each other (e.g., a self-esteem item followed by two locus-of-control items, followed by a self-esteem item) instead of being asked separately, and were sometimes mixed with items such as "Life is meaningless." The item order and placement also varied widely from year to year (see more on this later), which may have altered the results over time. Trzesniewski and Donnellan also mislabel several variables, calling "How much do you care about having the latest fashion in your clothes, records, leisure activities, and so on?"

materialism, when this is more likely conformity—thus, the decrease they find is entirely consistent with increasing individualism. They label "Compared with others your age around the country, how do you rate yourself on school ability?" as egotism, even though egotism has never been defined this way (egotism is a global sense of superiority, not one confined to intelligence or academic ability). In addition, many variables assessed in CTMAs are not asked in MTF, and many of these show large effects (see Figure 2).

**The Impact of Effects Under *d* = .20**

Trzesniewski and Donnellan do not perform standard significance testing and instead impose an arbitrary cutoff of $d = .20$. The result is a moving target of $p$ values (because sample sizes differed across items) and a failure to discuss a large number of changes that were significant at, for example, $p < .0001$. They thus not only base their argument on null effects, but expand the definition of "null" to include any effect they deem too small to matter. To say that there were no changes in a variable with statistically significant change at $p < .0001$—which they do numerous times—is highly questionable.

Many of the effects in MTF are moderate in size (see Table 1 and Fig. 1), but many others are relatively small. So, do small effects matter? First, they matter theoretically. They confirm the cultural changes many have identified (Fukuyama, 1999; Myers, 2000; Twenge, 2006; Twenge & Campbell, 2009). But what about practically? Even the smaller mean differences Trzesniewski and Donnellan report produce large changes at the ends of the distribution. Interest in government affairs decreases “only” at $d = -.13$, $t(6037) = 6.35$, $p < .001$ (1976–2006), but 38% more students in 2006 expressed no or very little interest in government (compared with those in 1976), and twice as many (9% vs. 4%) professed no interest at all. Similarly, 20% fewer 2006 students did more than 15 hr of homework a week, and 17% more

reported doing no homework at all[1] ($d = -.17$). A whopping 66% more 2006 students say that "having lots of money" is "extremely important" ($d = .28$). If, in 2006, twice as many young people are apathetic toward government, more do no homework at all, and many more highly value becoming rich and plan their future goals accordingly, this may have a large impact on society despite the relatively modest changes at the mean.

**Sampling Issues**

Trzesniewski and Donnellan suggest that they found smaller generational differences because of the superiority of the MTF sample over CTMAs. Among other arguments, they claim that samples of college students are unrepresentative. However, many CTMAs have examined child and adolescent samples—which should be more representative—and found results virtually identical to those in college samples (e.g., Twenge, 2001; Twenge & Im, 2007; Twenge et al., 2004). In addition, MTF samples high-school students in their last semester after some students have dropped out, so the biases are similar to those among beginning college students. MTF collects data only at the 66% to 80% of high schools that agree to participate; within these, about 79% of students complete the survey, with nonresponse "more common among boys, nonwhites, students in lower academic tracks, and students with lower grade point averages" (Reynolds et al., 2006, p. 192). Thus the claim that MTF is completely representative of young people whereas CTMAs use "convenience" samples is disingenuous; both types of samples have some bias. In addition, the pattern of results between MTF and CTMAs is remarkably similar, suggesting that sampling is not a large issue. Some of the effect sizes are smaller in MTF, but this may be due to age, as some CTMAs have also found smaller effects in high-school samples.

Trzesniewski and Donnellan's critique of sampling is also odd considering their own research, which has often relied on volunteer Internet samples (e.g., Robins, Trzesniewski,

Tracy, Gosling, & Potter, 2002) to make what they call "population-based inferences" on issues such as age differences in self-esteem. Volunteer Internet samples are subject to considerable bias (Malhotra & Krosnick, 2007), particularly if they are assumed to represent the U.S. population. In contrast, it is more than reasonable to expect that the samples of college students at 4-year universities in CTMAs are reasonably representative of the population of college students at 4-year universities.

This does not mean that research using Internet samples is flawed or should not be done. All methods have biases, and the highest levels of confidence occur when multiple methods converge on similar findings. When we find convergence across CTMA data, survey data, interview data, cross-sectional data, behavioral data, and historical economic data, as we have in our work on Generation Me and on narcissism (see, e.g., Table 1), our confidence in these conclusions increases.

**The Fallacy of the Ecological Fallacy**

Trzesniewski and Donnellan devote 10 paragraphs, 2 figures, a table, and a column in another table addressing the ecological fallacy. They then include a few sentences finally, and correctly, noting that CTMA does not use ecological correlations to compute effect sizes, but instead relies on individual-level *SD*s (as noted in print numerous times; e.g., Twenge & Im, 2007, p. 180; Twenge, Konrath, Foster, Campbell, & Bushman, 2008, p. 882; Twenge et al., 2004, p. 313). Thus there is essentially no difference between analyzing the data at a group or individual level, and the two types of analyses produce identical effect sizes (Twenge & Foster, in press). This critique is more than a red herring; it might be labeled a Swedish fish.

The issues are not complicated. When the sample mean is used as the unit of initial analysis, such as in CTMA, there is lower variance. For example, if you give same test in your

Introduction to Psychology class year after year, you can predict the class mean pretty well (let's say 75). If your class scores a 90, you would know there was a problem. If one student scored a 90, however, you wouldn't think there was a problem, because there is more variance in individual scores than class scores.

The same thing happens when you look at sample means in CTMA. There is not much error variance among means; hence the higher correlations. If you want to estimate the effect size of the difference across years, you have two choices. You can use the *SD* among means (usually small) or the *SD* within individuals (larger). It is standard practice in CTMA to use the individual *SD*. This yields a much smaller *d*, but it is, we believe, more useful because it allows people to conceptualize the change in terms as the variance associated with individual scores. Even so, there would be nothing "fallacious" about using the *SD* of the means; it would just answer a different question—about the size of the change in the entire population—that would not be as useful. Trzesniewski and Donnellan infer that psychologists are too dense to understand this, writing that "Psychologists are often unaccustomed to thinking about accounting for variability in a construct at this level." We disagree: One of psychology's great strengths is that we work at levels of analysis from culture to the gene. Most of us are comfortable with that.

As for the idea that CTMAs might produce higher effect sizes, this comment (Twenge et al., 2004) was added at the suggestion of a reviewer who pointed out that *d*s do not take the variance between groups into account. However, this is true of every effect size, as *d*s always rely on pooled variance and do not include intergroup variance. Thus if CTMA *d*s are inflated, so are the *d*s of every study and the meta-analysis using *d*s. In addition, the question of signs reversing is easily addressed: The scatterplots of CTMAs show that this has never occurred.

What about comparing *r*s from the entire sample and *d*s from the endpoints? The *d* is a measure of the change between two points (Trzesniewski and Donnellan averaged 5 years together, which potentially lowers the effect sizes, but the idea is the same). The *r* measures instead how well changes fit a straight line. These are different questions. Both are interesting, but using the *r* to capture change over time is less precise as the change could be curvilinear.

**Data on Self-Esteem and Narcissism**

Trzesniewski and Donnellan's analysis finds no change in self-esteem among 12th graders; our CTMA (Twenge & Campbell, 2001) also found no significant change among high-school students (though we did find significant increases in self-esteem among college students, $d = .62$, and children, $d$s = .55 and .67). A new meta-analysis does find a small increase in self-esteem ($d = .17$) from 1988 to 2005 among high-school students (Gentile, Twenge, & Campbell, 2009). The discrepancy might be explained by the measurement of self-esteem in MTF, which includes only 6 of the 10 Rosenberg Self-Esteem (RSE) items and—somewhat bizarrely—asks them not in sequence but mixed together with items on locus of control, meaninglessness, and other items (e.g., "I like to test myself every now and then by doing something a little risky"). In contrast, the studies in the CTMAs typically administered the RSE items sequentially without interference from other concepts. In addition, MTF has varied item order many times over the years, an inconsistency that may interfere with finding change over time: the self-esteem items were asked on one form (a subset of respondents) in 1976 (mixed with locus-of-control items), on two forms beginning in 1984 (only sometimes mixed with control items and after different questions), and across three forms since 1989 (sometimes mixed with items on whether life is meaningless). Even within forms, self-esteem items were asked after different questions in

different years (e.g., the risks of drinking alcohol vs. views on joining the military).[2] These significant changes in measurement could easily have suppressed effects.

For this response, we examined self-esteem among 8th and 10th graders in MTF surveys begun in 1991. These data suffer the same measurement problems as the 12th-grade survey used by Trzesniewski and Donnellan, with the 6 self-esteem items mixed with items on doing dangerous things and the hopelessness of life. Nevertheless, these groups increase in self-liking (3 RSE items as identified by Tafarodi & Milne, 2002) just as 12th graders do (Twenge & Campbell, 2008). For 8th graders, self-liking increases $d = .12$ over 16 years, equivalent to $d = .23$ over 30 years. Among 10th graders, self-liking increases $d = .06$ ($d = .12$ over 30 years). These effect sizes are smaller than found by CTMA, probably due to the measurement issues, yet all three age groups (8th, 10th, and 12th graders) increase in self-liking over the generations. These data even replicate the consistent finding that high-school students show smaller changes in self-esteem than other age groups (Gentile et al., 2009; Twenge & Campbell, 2001). Thus two analyses show increases in college students' self-esteem and three show changes in middle school students' self-esteem or self-liking (Gentile et al., 2009; Twenge & Campbell, 2001; and here). Of the five analyses of high-school students' self-esteem, two find no or very small change in self-esteem (Trzesniewski & Donnellan, 2010; Twenge & Campbell, 2001), another finds a small increase in self-esteem (Gentile et al., 2009), and two find a small increase in self-liking (Twenge & Campbell, 2008, and here for 10th graders). Thus the preponderance of the evidence shows increases in self-esteem and/or self-liking, with high-school students being the only age group with smaller or nonsignificant results—and even they show increases in some studies.

Changes are also apparent in narcissism, another CTMA they critique (Twenge et al., 2008). Trzesniewski, Donnellan, and Robins (2008) examined eight samples from University of

California campuses and concluded that, contrary to the nationwide CTMA finding an increase in narcissism, there was no change over time in Narcissistic Personality Inventory (NPI) scores. Their analysis perfectly confounded campus and year, as the 1982 sample was from UC Berkeley and Santa Cruz, the 1996 sample was from UC Berkeley, and the last six (2002–2007) were from UC Davis. However, the UC Davis data show significant increases in NPI scores when analyzed separately; in fact, they show a yearly increase twice the size found in the CTMA (Twenge & Foster, in press; note that this analysis covers only 5 years, so the year-by-year change is the fair comparison with our 24-year analysis). Because UC Davis samples produce lower average NPI scores than other campuses (Twenge & Foster, in press) and were collected more recently, there is a large confound between year and campus. Perfect confounding by campus also appears in the reanalysis by Donnellan, Trzesniewski, and Robins (2009), with the 1996 sample from Berkeley and the 2002–2008 samples from UC Davis. When the data from an updated CTMA and the UC samples are analyzed together with a simple control for campus (1 = Davis, 0 = not), the results show a clear increase in narcissism, $d = .37$ (for a full description of these analyses, see Twenge & Foster, in press). We believe it is important to consider all of the data, especially as Trzesniewski et al. (2008) analyzed only two samples between 1982 and 2001. In contrast, our CTMA had 58 samples from 1982 to 2001, including Trzesniewski et al.'s two. Choosing only 2 samples out of 58 does not seem like the optimal approach to us.

In addition, a nationally representative sample of Americans ($n > 34{,}000$) showed higher lifetime prevalence of Narcissistic Personality Disorder (NPD) among younger generations (Stinson et al., 2008). This study used data from face-to-face clinical interviews rather than self-report. Thus, increases in narcissism appear (a) in a nationwide sample in CTMA, (b) within campus at UC Davis, (c) when these data are combined and a simple control for campus is

added, and (d) in a National Institutes of Health study of lifetime prevalence of NPD. This is directly contradictory to Trzesniewski and Donnellan's assertion that personality traits do not change over the generations.

The increase in high expectations reported by Trzesniewski and Donnellan is also consistent with a rise in narcissism. Contrary to their claim that higher expectations for educational and professional attainment may reflect actual labor market conditions, Reynolds et al. (2006)—who originally analyzed these data—clearly showed that expectations have become increasingly disconnected from labor market realities. For example, twice as many high-school students in 2000 than in 1976 expected to work in a high-status job, even though the actual number of high-status jobs available has not changed. Twice as many expected to complete a graduate degree, even though the percentage of people actually earning graduate degrees has not changed. This disconnect between expectations and reality is exactly what would be expected with a rise in narcissism, defined as an inflated sense of self that leads to an overassessment of one's abilities and future prospects. Even changes that seem to contradict shifts in narcissism, such as the rise in high-school students saying they volunteer, are explained by outside mechanisms: High schools have increasingly required volunteer service to graduate.

**The Independence of Positive and Negative Affect**

Despite Trzesniewski and Donnellan's creative labels, the MTF dataset does not measure anxiety and depression, so it is not possible to test changes in mental health using these data. They cite some studies finding null effects in this area, but they fail to mention the numerous studies finding increases in negative affect, depression, and mental health problems over the generations—many using large and representative samples (e.g., Collishaw, Maughan, Goodman, & Pickles, 2004; Goodwin, 2003; Kessler et al., 2005; Lewinsohn et al., 1993;

Murphy et al., 2004; Scollon & Diener, 2006; Swindle, Heller, Pescosolido, & Kikuzawa, 2000). MTF does show small increases in happiness and life satisfaction, but these are measures of positive affect. Birth cohort studies generally find increases in both positive and negative affect (e.g., Scollon & Diener, 2006; Twenge, 2006). At first glance, this seems paradoxical, as (for example) extraversion, self-esteem, and narcissism are usually negatively correlated with anxiety and depression when measured at the same time among individuals, but all have increased over time. This may be an individual-level versus group-level issue: Perhaps some segments of the generation are increasing in positive affect and others are increasing in negative affect. Alternatively, narcissism has been shown to lead to negative affect over time, and this may occur at different times among individuals (Miller, Campbell, & Pilkonis, 2007; for a broader discussion of how individualism might cause increases in both negative and positive affect, see Eckersley & Dear, 2002).

## A CULTURAL APPROACH TO UNDERSTANDING CHANGE

There have clearly been large cultural changes in the last few decades. These changes have left their mark on the personality, self-views, attitudes, and behaviors of individuals. The size of the effects differs depending on the age group and specific measures used, but the preponderance of the evidence paints a very consistent picture of increased individualism and the traits related to it (materialism, narcissism, self-esteem, lack of trust). We encourage researchers to cast a wide net in future research, capturing changes in cultural products, economic activity, demographics, and individual behaviors as well as individual characteristics.

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**Fig. 1.** A sample of evidence for Generation Me from the Monitoring the Future dataset.

**Fig. 2.** A sample of evidence for Generation Me from cross-temporal meta-analyses (CTMAs). Data are from college student samples unless otherwise noted.

[1]The number of students reporting an A average in high school doubled over the same time period in MTF (Twenge & Campbell, 2008), so, assuming self-reported grades reflect reality, students are getting better grades for doing less work, which is another conclusion that is very consistent with a more entitled culture.

[2]In their comment on Twenge and Campbell (2008), Trzesniewski and Donnellan (2009) criticize us for using MTF data from 1975, noting that the item order changed between 1975 and 1976. However, as noted above, the item order in MTF also changed many other times over the

years, so unless the entire dataset is going to be discarded, there is no reason to exclude the 1975 data as a special case.