

RUNNING HEAD: CHANGE IN SELF MISTAKEN FOR CHANGE IN WORLD

When Change in the Self is Mistaken for
Change in the World

Richard P. Eibach

Lisa K. Libby

Thomas Gilovich

Cornell University

Abstract

We examined whether and when changes in the self lead to mistaken assessments that the world has changed. National and local survey data were consistent with our thesis: personal changes in respondents (i.e., parenthood, change in financial status) were positively correlated with their assessments of various social changes (e.g., crime rates, freedom in America). Experimental data provided converging evidence. Experimentally induced change in participants' knowledge influenced their perceptions of change in an author's writing style from one decade to the next (Study 3). When changes in the self were brought to people's attention and they had the cognitive resources to consider how such changes might affect their perceptions, judgments of change in the world were attenuated (Studies 4, 5, and 6). Discussion focuses on how such misattributions of change may help explain the pervasive belief in societal and cultural decline.

When Change in the Self is Mistaken for Change in the World

In Walker Percy's novel *The Thanatos Syndrome*, the protagonist, Dr. Tom More, has been away from his hometown for two years. When he returns, he discovers that many of his former friends and acquaintances seem to have changed, as if their personalities had been altered. Dr. More wonders whether the apparent change is real, or whether his friends merely seem different because he himself has changed since he'd been away. Noting one acquaintance whose personality seemed to have changed, Dr. More states, "I left Mickey's room and started down the hall, musing over the changes in Mickey. How much of the change, I was wondering, comes from my two years away and the change in me?" (1987, p.10).

Dr. More's question shows an awareness of perception's dialectical nature. Because perception is constructive, what is perceived is influenced by properties of the perceiver as well as the perceptual objects themselves. As Neisser (1967) put it:

[T]he detailed properties and features we ordinarily see in an attended figure are in a sense "optional." They do not arise automatically just because the relevant information is available in the icon, but only because part of the input was selected for attention and certain operations were performed on them. Neither the object of analysis nor the nature of the analysis is inevitable, and both may vary in different observers and at different times. (p.94)

Thus, the features of an object that a perceiver attends to and the analytic operations performed on those features may differ at different points in time—potentially causing the object to appear different, even if it has, in fact, remained unchanged.

The question troubling Dr. More in Percy's novel captures an inferential ambiguity present in most assessments of change in the external world. Unlike Rip Van Winkle, who

remained static while the world about him evolved, real world perceivers are dynamic entities. Attributes of the environment and attributes of perceivers often change simultaneously. In such instances, an accurate judgment of change in the world requires that one take changes in the self into account. We argue that perceivers do not always take self-change into account when rendering judgments of world-change, and that even when they do they often will not correct for self-change adequately. Therefore, in cases where perceivers have undergone changes in themselves, we predict they will frequently overestimate the amount of change in the world. Findings from at least two areas of research support this prediction.

One body of research shows that people are often blind to changes in the self. Michael Ross (1989) has proposed that without a salient theory of self-change, people will assume that the way they are now is the way they were in the past. People misremember their prior attitudes, for example, as being more consistent with their present attitudes than is actually the case (Bem & McConnell, 1970; Goethals & Reckman, 1973; Levine, 1997; McFarland & Ross, 1987). Referring to such a conservative bias in thinking about the self, Greenwald (1980) writes, "[P]eople's readiness to rewrite memory permits new information to be received and incorporated into the cognitive system without the system's registering the occurrence of change (p.608)." If one is unaware of a change in the self, one cannot take it into account when trying to explain a change in one's perceptions—and so the change is attributed to the external world.

However, even when people are aware of a change in the self, they may not recognize how it has affected their perceptions of the world around them. This follows from research indicating that people tend to be "naïve realists", failing to appreciate the extent to which their perceptions are actively constructed rather than passively – and veridically – received (Gilbert, 1991; Kelley & Jacoby, 1996; Ross & Ward, 1996; Subbotsky, 2000). In one memorable

demonstration of this phenomenon (Newton, 1990, as cited in Griffin & Ross, 1991), participants were assigned either to tap the rhythm of a well-known song or to listen to the song being tapped without knowing what it was. When the tappers estimated the proportion of people who would be able to guess the song being tapped, their estimates suggested that they did not appreciate the extent to which their perceptions of their tapping were influenced by their knowledge of the song, and were not unelaborated representations of the stimulus. Tappers estimated that 50% of listeners would identify the song, whereas only 2.5% actually did so. As naïve realists, people overestimate the extent to which their perceptions are caused by the objects they perceive, rather than by constructive processes in their own heads. If so, then people may tend to assume that the world has changed when their perceptions do.

Our hypothesis is consistent with research on the “psychological immune system” (Gilbert, Brown, Pinel, & Wilson, 2000). When faced with suboptimal outcomes, people seem able to alter their construals of such events, turning them into subjectively more favorable outcomes. Gilbert and colleagues argue that when people seek to explain why these outcomes seem favorable, they “...tend to look for those explanations on the wrong side of their skins” (Gilbert et al., 2000, p. 698). In their experiments, participants who reconstrued objectively suboptimal outcomes as subjectively favorable were more likely to believe that a benevolent external agent affected their outcomes. We contend that when people detect a change in how the world appears to them, they likewise tend to “look on the wrong side of their skins” for an explanation. The end result is that people who have themselves changed overestimate the extent to which the world has changed.

This existing research on self- and social-judgment is consistent with our intuition that people can arrive at exaggerated perceptions of change in the world for different reasons. Most

commonly, perhaps, it results from an automatic assumption that the difference lies in what is seen to be different – the world. Because, as naïve realists, people tend to believe that they see the world the way it *is*, not as it is filtered, interpreted, or construed, differences in how the world appears will tend to be experienced as differences in how the world is. And, unless something triggers the thought that things may not be as they seem, change is reflexively attributed to something about the world, with no consideration given to the role played by any contributory changes in the self.

On other occasions, however, relevant changes in the self are salient and a more deliberate attributional dilemma is faced. Sometimes the dilemma is easily resolved because the world cannot have changed. When the childhood home is revisited as an adult, the impression that it has become smaller is quickly dispelled and the change is attributed to the psychological realm. Similarly, when an adult re-reads one of the adolescent classics such as *Catcher in the Rye* or *Gone with the Wind* and finds it less compelling than it seemed originally, there is no illusion that the writing itself has changed. One's own development is quickly seen as the cause. Of course, there are other occasions in which the attributional dilemma is not so easily resolved. "Are the graduate students less friendly here, or is it my new status as faculty member?" "Has globalization reduced the price of everything, or is it that I'm finally making real money?" In these cases, both possibilities are viable and one faces the difficult task of deciding how much the change in the self is responsible for the apparent change in the world. These sorts of judgments can be difficult to calibrate (Wilson, Centerbar, & Brekke, 2002).

Misperceptions of change and belief in societal decline

Our thesis allows the possibility that both positive and negative changes in the self can be misattributed to the world. But it is striking how often people offer the observation that things

are changing for the worse from one generation to the next, and the processes we investigate in this paper may contribute to this tendency. This belief is evident both in casual laments about "the good old days" and in systematic public opinion surveys. In a 1998 TIPP/Christian Science Monitor poll, for example, 66% of respondents said that today's moral climate is worse than that of the 1950's (Dillin,1998). Eighty percent of respondents reported believing that children today are more spoiled than they were ten or fifteen years ago (Gibbs, 2001). And it is not just the moral standards and training of kids that are perceived to be in decline. In a 1994 General Social Survey (GSS) interview, 69% stated that the lot of the average man is getting worse. Seventy-four percent of respondents to the 1998/1999 Multi-investigator Study survey (Sniderman, et al., 1999) thought that crime in the United States was worse at the time of the survey than it was 10 years earlier. Finally, 67% of respondents to the 1990 GSS survey reported that the safety of neighborhoods at the time was worse or much worse than it was 10 years before.

The belief that society is changing for the worse is not unique to this era. It has been evident in every generation of the United States since the late eighteenth century (Scott and Wishy, 1983, reported in Schwarz, Wanke, & Bless, 1994). And similar attitudes can be found among the ancient Greeks, and in the myths of cultures as diverse as the Aztecs and Zoroastrians. As historian Arthur Herman (1997) notes, "Virtually every culture past or present has believed that men and women are not up to the standards of their parents and forebears." Robert Bork (1996) makes the point that this suggests that each generation's judgments of cultural demise are likely exaggerated:

To hear each generation speak of the generation coming along behind it is to learn that our culture is not only deteriorating rapidly, but always has been. Regret for the golden days of the past is probably universal and as old as the human race. No doubt the elders

of prehistoric tribes thought the younger generation's cave paintings were not up to the standard they had set. Given this straight-line degeneration for so many millennia, by now our culture should be not merely rubble but dust. Obviously it is not: until recently our artists did much better than the cave painters (p.6).

Our thesis identifies one previously-neglected factor that may contribute to this belief in societal decline: unrecognized changes in individual perceivers. Perceivers who have undergone changes in themselves, and have failed to recognize that change, are likely to interpret the world differently and hence conclude that social conditions have changed. We thus began our investigation of the tendency to confuse self-change with change in the world by examining people's belief in societal decline. In particular, we examined both archival and our own survey data to determine whether personal changes experienced by respondents are associated, in predictable ways, with their assessments of social decay.

We then tested our broader thesis in four laboratory experiments. In the first, we assessed how an experimentally-induced change in participants themselves would affect their perceptions of change in a poet's writing. The remaining experiments explored the boundary conditions of this phenomenon by manipulating the salience of participants' own changes. If a lack of awareness of self-change contributes to overestimates of change in the world, then making people aware of self-change should reduce their perceptions of change in the world. Furthermore, if people tend to assume that their perceptions of the world are direct and veridical, and stray from that assumption only with the expenditure of effort, awareness of self-change should only reduce judgments of external change when people have the cognitive capacity to overcome this assumption.

Study 1

As an initial test of our thesis, we analyzed archived data from two opinion surveys conducted in the United States in the year 2000. These respondents were asked to make judgments of societal change as well as to provide information pertinent to changes in themselves. We predicted that relevant personal changes would be associated with their judgments of societal change.

The 2000 General Social Survey (GSS) asked respondents how freedom in America has changed. One personal change that could affect an individual's feelings of freedom is a change in financial status. As Franklin Delano Roosevelt said, "True individual freedom cannot exist without economic security and independence." In general, the more financial resources a person has, the more freedom and opportunity there is to pursue a whim. Thus, a person whose financial resources have declined may experience a reduction in personal freedom and someone whose financial situation has improved may find that he or she feels freer than in the past. If the person does not attribute these changes in perceived freedom to the change in his or her own pocketbook, it may be misattributed to broader social trends. We thus predicted that changes in respondents' personal finances would be associated with perceived change in the amount of freedom in America.

The 2000 National Election Study (NES) asked respondents how crime rates had changed over the previous eight years (i.e., from 1992 to 2000). Crime declined dramatically across the country during the 1990's (Bureau of Justice Statistics, 2001; LaFree, 1999), but subjective experience sometimes departs from objective social reality (Asch, 1952). Becoming a parent is one personal change that could influence the subjective perception of danger in the world. Parenthood generally enhances a person's sensitivity to various threats and dangers in the

environment (Ruddick, 1995). Formerly innocuous items such as Venetian blind cords, buckets of water, electricity outlets, and cabinet medications become hazards requiring ever-vigilant parental attention. Even profanities, which may once have peppered one's everyday conversation, can seem, well, more profane when one becomes a parent. Of that most notorious English profanity, the "F word", journalist Elizabeth Austin (1998) writes, "Becoming a parent induces hypersensitivity to the word's ubiquitous presence in movies, on cable TV, in music, and in the loose talk of childless friends" (p.58).

If having a child enhances a person's attention to dangers in the environment, and if a parent is less than fully aware of this effect, he or she might develop the conviction that the world has suddenly become a more dangerous place. We thus predicted that respondents who first became parents between 1992 and 2000 would be more likely to perceive an increase in crime during that interval than would respondents who did not become parents in that time period. If so, this would provide evidence that the tendency to attribute change in the self to change in the world can be sufficiently powerful to produce perceptions of social change that run counter to objective trends.

Method

Freedom

Participants. The 2000 GSS asked 1,419 participants about changes in the amount of freedom in America. Of these, 18 did not respond to the question and 18 responded "don't know". Our analyses drew on the data from the remaining 1,383 participants, ranging in age from 18 to 89 years ($M= 46.5$, $SD= 17.4$). Fifty-six percent were women.

Procedure. The GSS is an interview-based survey conducted by the National Opinion Research Center (NORC) on a nearly annual basis since 1972. The GSS interview includes a

variety of demographic questions (e.g., whether or not the respondent had children) and questions eliciting respondents' opinions, judgments, and behavioral habits related to a wide variety of topics (e.g. politics, racial attitudes, values). The GSS is based on a multi-stage area probability sample. Further information about the sampling techniques and interview procedure can be found at: <http://www.icpsr.umich.edu/GSS/title.htm>.

In the 2000 interview, respondents were asked how much freedom Americans have today compared to the amount they had in the past: more, less, or about the same. Respondents were also asked how much freedom they themselves had today compared to the amount they had in the past, using the same three options. In a final question pertinent to our analysis, respondents were asked, "During the last few years, has your financial situation been getting better, worse, or has it stayed the same?"

Crime

Participants. Participants were 1,807 respondents to the National Election Study (NES) 2000 survey, a representative sample of U. S. citizens aged 18 and older who were eligible to vote in the November 2000 Presidential election. The respondents resided in 48 of the 50 states; citizens from Alaska and Hawaii were not included. One thousand six respondents were from a multi-stage area probability sample and were interviewed face-to-face. The remaining 801 were interviewed by telephone and selected using a random-digit dialing procedure. The details of both sampling procedures can be found at:

<http://sda.berkeley.edu:7502/D3/NES2000/Doc/ns00i05.htm>.

Of the 1,807 participants, 129 did not answer the question concerning change in crime rates and an additional 47 responded that they did not know how crime rates had changed. Our

analyses drew on the data from the remaining 1,631 participants, ranging in age from 18 to 97 years ($M= 47.6$, $SD= 17.0$). Fifty-six percent were women.

Procedure. The 2000 NES survey contained questions covering a variety of content areas including attitudes regarding the 2000 presidential election, knowledge of political issues, positions on social issues, and demographic information. Our analyses focused on respondents' answers to questions concerning changes in the crime rate from 1992 to 2000. Respondents were asked, "Would you say that compared to 1992 the nation's crime-rate has gotten better, gotten worse, or stayed about the same?" If a respondent answered that the crime-rate had gotten better or worse, s/he was asked to specify whether it had changed "much" or "somewhat". This allowed us to score participants' responses on a 5-point scale ranging from -2 ("the crime rate has gotten much worse") to 0 ("the crime rate has stayed the same") to $+2$ ("the crime rate has gotten much better"). In a separate section of the interview, participants indicated the ages of any children they had.

Results and Discussion

Freedom

As expected, beliefs about change in the amount of freedom in America were associated with change in participants' financial status (See Table 1). The proposition that freedom in America had increased was endorsed by 46% of those whose finances had improved but only 39% of those whose finances had not improved. The proposition that freedom in America had neither increased nor decreased was endorsed by 43% of those whose personal finances had remained the same but only 36% of those whose finances changed. Finally, the belief that freedom in America had declined was endorsed by 23% of those whose personal finances had

declined but only 18% of those whose finances had not declined. A chi-square analysis indicated that this pattern is reliable, $\chi^2(4) = 11.64, p < .05$.

We conducted a mediational analysis¹ to determine whether changes in respondents' own feelings of freedom mediated the association between change in respondents' financial status (the independent variable) and respondents' assessments of change in the amount of freedom in America (the dependent variable). First, we regressed participants' perceptions of change in the amount of freedom in America on their reported change in their own financial status, which yielded a significant association ($\beta = 0.07$), $t(1,368) = 2.63, p < .01$. Second, we regressed participants' assessments of change in their own freedom (the proposed mediator) on their reported change in financial status, which also yielded a significant association, ($\beta = 0.11$), $t(1,368) = 4.29, p < .0001$. Finally, we regressed participants' assessments of change in the amount of freedom in America on both the independent variable and the mediator. This analysis revealed that the relationship between change in respondents' own financial situation and respondents' judgments of change in the amount of freedom in America was no longer significant ($\beta = 0.01$), $t < 1$. However, the mediator – participants' assessments of change in their own freedom – remained significant in that same regression ($\beta = 0.51$), $t(1,367) = 21.77, p < .0001$. A Sobel test, conducted using specifications from Baron and Kenny (1986), revealed that there was a significant reduction in the beta weight for the direct effect of condition when the mediator was controlled; ($z = 5.24, p < .0001$).

Crime

We used participants' reports of their children's ages to determine whether they had experienced a transition to parenthood during the period in question. Respondents with children

9 years of age or older and those with no children were classified as the no-transition group. Respondents with children 8 years old or younger were classified as the transition group.

We hypothesized that the transition group would be more likely to assert that crime rates had worsened over the previous 8 years than would the no-transition control group. Consistent with our hypothesis, 38% of the transition group but only 29% of the control group thought crime rates had increased, 29% of the transition group and 32% of the control group thought crime rates had not changed, and 32% of the transition group compared to 39% of the control group thought crime rates had declined; $\chi^2(2) = 6.91, p < .05$. It is noteworthy that the most common response selected by the control group was the accurate statement that crime rates had declined whereas the most common response selected by the transition group was the inaccurate statement that crime rates had increased.

Further support for our thesis was obtained when the data were analyzed parametrically, using the 5-point scale constructed from participants' responses. Those who first became parents during the critical period thought crime had intensified more since 1992 ($M = -0.16, SD = 1.16$) than did respondents who did not become parents during this period ($M = 0.07, SD = 1.18$), $t(1618) = 2.62, p < .01$.² Moreover, the average judgment for the transition group was significantly less than zero, $t(211) = 2.02, p < .05$, indicating that NES respondents who became parents during the critical period perceived a direction of change in crime rates significantly at variance with the actual change. These data thus support our contention that changes in sensitivity to danger that people experience as they become parents are associated with an increased perception of danger in the world.

Study 2: Perils of parenthood

We conducted Study 2 ourselves as a follow-up to our analysis of the archival data. We asked a sample of elementary school employees of various ages to compare the amount of danger in the world today to the amount that was present at a number of specific points in the past. The data from Study 1 showed a relationship between transition to parenthood during the years 1992 to 2000 and a perception of decline in society over that same period. Showing that this effect generalizes to other time periods would strengthen our claim that parenthood causes changes in individuals' perceptions of the world that they mistake for actual changes in the world. As mentioned earlier, the perception that American society is in decline is widespread. However, our account predicts that people should perceive a particularly abrupt change in safety during the particular time period in which they made the transition to parenthood.

Method

Participants. Sixty surveys were distributed to the mailboxes of teachers and staff at a public elementary school in the Northeastern United States. Participation was voluntary. We received 51 completed questionnaires. Thirty-one respondents (7 men, 23 women, and 1 individual whose sex was not recorded) had experienced a transition to parenthood within the time period covered by our questionnaire (the last 30 years). Their ages ranged from 33 to 60 years ($M= 46.2$, $SD= 6.2$) and the number of years they had been parents ranged from 3 to 29 ($M=18.3$, $SD=7.3$). The remaining respondents were not parents or had experienced the transition to parenthood longer than thirty years ago.

Procedure. We solicited judgments on three topics: 1) change in the safety of neighborhoods, 2) change in the magnitude of risks and dangers facing children, and 3) change in the temptations and pressures faced by children. For each topic, participants made six

temporal comparison judgments, comparing the state of the world today to the world 5, 10, 15, 20, 25, and 30 years ago.

Change ratings were made on a 5-point scale. Specifically, participants completed statements of the form, “The risks and dangers that kids face growing up today are ___ than they were 5 years ago” by selecting one of the following numbered phrases: -2 “much lower than”, -1 “somewhat lower than”, 0 “neither higher nor lower than”, +1 “somewhat higher than”, and +2 “much higher than”..

After completing the 18 comparison judgments (six temporal comparisons for each of the three topics), participants provided background information such as their age, sex, number of children, and the date of birth of their first child.

Results and Discussion

Responses to the neighborhood safety question were reverse scored so that higher numbers represent greater decline on all three measures (danger in neighborhoods, risks to children, and temptations/pressures on children). Because the three measures were highly intercorrelated (mean across participants = .76), we summed the three change ratings for each participant and each time period to create an overall index of perceived increase in social danger.

We expected that participants would perceive an increase in danger coinciding with the timing of their transition to parenthood. Specifically, we expected a significant increase in a participant's ratings of the contrast in danger between the present and the past during the interval in which that participant became a parent. For example, consider a participant who first became a parent 12 years ago. This participant should perceive more danger when comparing the present to 15 years ago than when comparing the present to 10 years ago because s/he was not a parent 15 years ago, and hence was less sensitive to various dangers and threats back then. However,

when this participant compares the world today to 10 years ago, s/he should see less change because s/he was already perceiving the world through the eyes of a parent at that time, just as s/he is today. Thus, for this participant there should be an increase in contrast ratings from the 10-year rating to the 15-year rating.

To test this hypothesis, we first located the participant's transition to parenthood using the reported year of birth of their first child. We examined whether the change in participants' ratings during the transition interval tended to be greater than the mean change during that interval for a comparison group consisting of all participants who did not experience a transition to parenthood during that interval.

Table 2 presents the relevant data. It shows, for each interval, the mean change in relative danger ratings for participants who experienced a transition to parenthood during that interval and the mean change for everyone else. Note that the transition group perceived more change than the no transition counterparts in five of the six comparisons (the one exception occurring in the interval with a single participant in the transition group). Overall, the mean change for those experiencing a transition ($M= 1.6, SD= 1.6$) was significantly greater than the mean change for the contrast group ($M= 0.63, SD= 0.25$); $t(30) = 3.58, p < .001$.³ This result indicates that a participant who became a parent during a given interval perceived a greater change in social danger during that interval compared to participants who did not become parents during that interval. It should be noted that the difference between a participant's change during the critical transition interval and the comparison group's mean change for that interval was not significantly associated with participant's age, $r(29)= .04$, length of parenthood, $r(30)= .01$, or sex, $r(30)= .10$.

Although participants in general perceived an increase in danger from the past to the present, they perceived an unusually large increase that coincided with their transition to

parenthood⁴. The transition to parenthood brings with it increased awareness of the dangers lurking in the world. Our data suggest that rather than attribute this enhanced sense of danger to the rather salient change in their own lives, participants attributed at least part of it to changes in the world.

Study 3: Poetry in motion

In Study 3 we sought to move beyond the correlational methodology employed in Studies 1 & 2 by testing whether an experimentally induced change in participants' perceptions would produce a similar misattribution to a change in the world. Our paradigm was built on the premise that people are influenced by their knowledge of an author when interpreting the themes and meanings contained in his or her texts. As Gibbs (1999) observed, "It is almost impossible for us to view van Gogh's later paintings and not think about the sliced off ear, the suicide, and how the whirling landscapes might be the result of unconscious impulses that drove van Gogh to paint as he did" (p. 13). More generally, he noted, "Our reading of what many texts mean seems inseparable from our awareness of who the author is who penned the work" (pp. 7-8).

We thus presented participants with two selections of an author's work, one from the author's earlier writing and one from a more recent collection. Half the participants were given background information about the author before reading both selections; the other half were given the background information after reading the first selection but before the second. We predicted that the change in the reader's knowledge about the author between the two texts would lead to a perceived change in the thematic and stylistic content of the works. Although the real change would thus be in the reader's knowledge and interpretive schemata, we predicted that the reader, unaware of the interpretive work performed in the act of comprehension, would nonetheless believe that the change was inherent in the texts.

The biographical information supplied to readers was information that the author was gay. We expected this would lead readers to perceive gay themes in his writings. If participants received this information before reading either of his writings, they should read gay themes into both texts and perceive little change in the author's use of such material. But if participants received this information after reading the first text and before the second, they should detect more gay themes in the second text. The key question is whether participants would correctly attribute this increase to the change in their own knowledge, or whether they would erroneously conclude that the thematic content of the author's writings had changed.

Method

Participants. Forty-eight undergraduates at Cornell University, 37 females and 11 males, participated for extra-credit in psychology and human development courses.

Materials. The stimuli were two poems written by J.D. McClatchy: "Fog Tropes" from his 1990 book *The Rest of the Way: Poems*; and "Betrayal" from his 2000 book *Ten Commandments: Poems*. These poems were selected because they contained subtle gay themes that could go unnoticed if the reader was unaware of the poet's sexual orientation and because they had been published in two different collections separated by ten years.

In addition to reading these two poems, participants also read a brief biographical sketch of the author indicating that he is a white, gay man who, in addition to being a poet, is an opera lyricist, a literary critic, and editor of *The Yale Review*.

Procedure. Participants were asked to rate the contents of two short poems, under the pretext that ratings were needed from neutral coders who were unaware of the study's hypotheses. The participants were randomly assigned to one of two conditions. In both conditions the order in which participants read the two poems was counterbalanced. In the *no*

change condition, the participants were provided with the biographical information about the author at the beginning of the study, before they had read either poem. In the *change* condition, participants read one of the two poems, and then the experimenter gave them the biographical information, explaining apologetically that he had forgotten to have them read it at the beginning of the experiment. This was done to reduce suspicion about the timing of the introduction of this information.

After reading the second poem, participants in both conditions rated the poems' contents. Specifically, participants were asked to indicate: 1) which of the two poems had more gay-related themes, 2) which of the two had more gay-related themes in the subtext, and 3) which of the two had more explicitly gay subject matter. Participants recorded each of these judgments by circling the relevant poem's title or circling an option indicating "neither."

The questionnaire then instructed participants that if they had indicated any difference in the content of the two poems, they should record their judgment about the likely cause of that apparent difference. They were given three options to explain the apparent difference: 1) "Something about the content or style of this author's writing may have changed from the first to the second poem," 2) "Something about me may have changed from the time that I read the first poem to the time that I read the second poem," 3) "I'm not sure." The participants were instructed to circle the explanation they found most plausible.

The key dependent measure was designed to ensure that participants' responses reflected genuine belief that the author's writing had changed. In particular, we asked participants to consider what would happen if a randomly selected group of Cornell undergraduates read these two poems, without any information about the author or the context in which these poems were written. Participants were asked to estimate the percentage who would pick the first poem, the

second poem, and the neither option when making the same three decisions that the subjects themselves had made (which poem contained more gay themes, more gay subtext, and more explicitly gay content).

Results and Discussion

Our hypothesis was that participants in the *change* condition, who were exposed to the biographical information after reading the first poem but before the second, would be more likely to indicate that there had been an increase in gay-related content from poem 1 to poem 2 than would participants in the *no change* condition. For the participants in the change condition the biographical information should have primed them to find gay themes in the second poem that they had not been primed to find in the first. We predicted that if the participants failed to realize that the change in their information would have this asymmetrical priming effect they would view the change in their reading as a change in the actual content of the poet's writing.

Participants' choices for the three main judgments (which poem contained more gay themes, more gay subtext, and more explicitly gay content) were highly correlated ($r = .86$), so we summed them to form a composite index of judged change in gay content. The choices were coded as -1 if the participants selected the first poem, 0 if they selected the neither option, and $+1$ if they selected the second poem for each of the three judgments. Thus, higher scores reflect a tendency to "detect" more gay content in the second poem.

As predicted, participants in the *change* condition "detected" a significant increase in gay content from the first to the second poem ($M = 0.71$, $SD = 1.20$), $t(23) = 2.90$, $p < .01$, but participants in the *no change* condition did not ($M = -0.46$, $SD = 2.28$), $t < 1$. The judgments rendered by participants in the two conditions differed significantly from one another, $t(46) = 2.22$, $p < .05$.

Did participants misattribute what they saw as an increase in gay themes to a change in the author's writing? If so, they should expect a majority of their peers to make the same judgments, even if those peers did not have access to background information about the author's sexual orientation. For each participant, we created a composite measure of the estimated percentage of peers who would judge the second poem as having more gay content by averaging together each participant's estimates of the percentage of their peers who would say that the second poem had more gay-related themes, more gay-related subtext, and more explicitly gay contents. As predicted, participants in the *change* condition estimated that a higher percentage of their peers would choose the second poem as having more gay content ($M = 60.75\%$, $SD = 24.73$) than did participants in the *no change* condition ($M = 44.35\%$, $SD = 29.72$), $t(23) = 2.08$, $p < .05$.

Finally, when we directly asked whether they would attribute the source of the perceived difference to a change in themselves or a real change in the content of the poems, a large majority (85%) indicated that they believed the apparent change was due to a change in the content of the poems, $t(47) = 16.59$, $p < .001$.

Participants whose knowledge about an author's sexual orientation had changed perceived a greater change in the author's use of gay themes than did participants whose information about the author's sexual orientation remained constant. Of course, it is to be expected that introducing new information about an author between the readings of two poems would influence participants' reading of the second poem. The critical result, however, is that participants did not perceive the difference in their interpretation of the first and second poems to be the result of the new information they received but rather a result of a genuine difference in the poems themselves.

A recent, real-world episode parallels the design and results of this experiment. In May of 1997, the character played by Ellen Degeneres on her ABC sitcom *Ellen* came out as a lesbian, a unique event in television history. The sitcom was cancelled a year later, due to a steep decline in ratings, which at least one ABC executive – Robert Iger - attributed to the fact that the show's themes had become excessively gay (Sawyer, 1998). Undoubtedly, the show had more gay themes after the character came out than it had in prior episodes. But the present findings suggest that the true magnitude of change in the show's content may have been less marked than it was perceived to be. After the coming out episode, the viewers watched and interpreted the character's every behavior knowing she was a lesbian, a slant they did not have before the character came out. The knowledge that the character was a lesbian likely changed the audience's interpretation of her behavior in such a way as to make the character and the show's content appear to have changed more than it actually had. Thus, a change in the audience's knowledge and interpretive schemas may have led to an exaggerated perception of change in the content of the show, just as participants in our experiment exaggerated the amount of change in an author's writings.

Study 4: My Hometown

The previous studies documented that changes in the self – the transition to parenthood, change in financial status, and additions to one's knowledge base – can increase participants' perceptions of change in the social world. Our explanation of these effects hinges on the assumption that people fail to recognize or inadequately correct for the effects that self-change has on their perceptions of the world. By inadequately correcting for changes in themselves, people overestimate the amount of change in the world.

If so, then inducing participants to believe that they themselves have changed in a given period should reduce the magnitude of their judgments of external change for that same period. In contrast, dampening participants' judgments of self-change should increase the perceived magnitude of external change. In Study 4 we sought to influence participants' assessments of change in the world by manipulating their views of how much they have changed over a given time period. We did this by requiring participants to generate either a short or long list of things about them that had changed during the period in question. Following Schwarz et al. (1991), we predicted that participants in the short list condition would find it relatively easy to generate the requisite number of changes, and thus conclude that they had changed a fair amount. In contrast, we predicted that participants in the long list condition would find it relatively difficult to generate the required number of changes, and thus conclude that they had changed relatively little. Furthermore, we predicted that participants' assessments of self-change over the specified period would influence their assessments of how much the world had changed during that time. Thus, we predicted that short list participants, led to see themselves as having changed a great deal, would judge the world to have changed less during the period in question than would long list participants, who were led to see themselves as having been relatively stable.

Method

Participants. Eighty Cornell University undergraduates (32 males, 48 females enrolled in psychology or human development classes) filled out our questionnaire as a filler task in various unrelated experiments.

Procedure. Participants were randomly assigned to receive one of two versions of the questionnaire. In the *short list* condition, participants were asked to list three things about themselves that had changed since they had been in high school. The instructions read:

On the lines below please list 3 things about yourself (your personality, your attitudes, your perspective on things, etc.) that have changed since you were in high school. List one thing about you that has changed on each of the lines, for a total of 3 separate things about you that have changed. Be as specific as you can in describing each of the things about you that have changed since you've left high school and become a college student.

The instructions in the *long list* condition were the same, except they were to list 12 things about themselves that had changed since high school.

The second page contained the dependent measures. The first question asked participants to rate how hard it had been to think of three [twelve] ways they had changed since high school on a 7-point scale ranging from 0 (very easy) to 6 (very difficult). The next question asked participants to rate how much they had changed since high school on a 7-point scale ranging from 0 (I haven't changed at all) to 6 (I was very different in high school). The final four questions asked participants to rate how much various aspects of their external worlds had changed since high school. Specifically, they were asked to rate how much their hometown, parents, high school friends, and their high school itself had changed since they had graduated. Each of these ratings was made on a 7-point scale ranging from 0 (no change) to 6 (a great deal of change).

Results and Discussion

Manipulation checks. As anticipated, participants in the *short list* condition reported that listing things about themselves that had changed was significantly less difficult ($M= 2.78$, $SD =1.68$) than did participants in *long list* condition ($M= 3.80$, $SD= 1.57$), $t(78)= 2.71$, $p <.01$. Note also that 6 participants in the *long list* condition but no one in the *short list* condition indicated that they were unable to generate the required number of changed attributes. Participants in the

short list condition also reported that they had changed significantly more since high school ($M = 3.10$, $SD = 1.17$) than did participants in the *long list* condition ($M = 2.25$, $SD = 1.34$), $t(78) = 3.03$, $p < .005$. Finally, judgments of the task's difficulty and judgments of self-change were negatively correlated ($r = -.24$, $p < .05$).

Primary dependent measures. Because participants' four ratings of change in the external world were intercorrelated ($r = .71$) we summed them to create a composite measure of perceived external change. As predicted, participants in the *short list* condition (who thought they had changed) thought the external world had changed significantly less since they left high school ($M = 9.63$, $SD = 4.98$) than did participants in the *long list* condition ($M = 12.20$, $SD = 4.80$), $t(78) = 2.35$, $p = .021$.

As an additional test of our hypothesis, we correlated participants' ratings of self-change with their summed ratings of external world change. As predicted, these variables were significantly negatively correlated ($r = -.28$, $p = .01$).

Finally, we conducted a mediational analysis to determine whether the effect of our manipulation (listing 3 or 12 examples of self-change) on the dependent variable (perceived change in the world) could be attributed to the proposed mediator (perceived change in the self). First, we regressed respondents' summed judgments of change in the world on whether they were in the *short* or *long* list condition, which yielded a significant association, ($r = -.26$), $t(78) = 2.36$, $p < 0.05$. Second, we regressed respondents' judgments of change in themselves (the proposed mediator) on whether they were in the short or long list condition, which also yielded a significant association, ($r = 0.32$), $t(78) = 3.03$, $p < 0.01$. Finally, we regressed participants' assessments of change in the external world on both the independent variable (short or long list) and the proposed mediator (assessments of self-change). This analysis revealed that experimental

condition was no longer a significant predictor of the dependent measure ($\beta = -.18$), $t(78) = 1.62$, $p > 0.1$), but the proposed mediator was ($\beta = -0.23$), $t(78) = 2.00$, $p < 0.05$. A Sobel test revealed that there was a marginally significant reduction in the beta weight for the direct effect of condition when the mediator was controlled; ($z = 1.64$, $p < .1$).

We proposed that a sense of one's own change or stability would influence judgments of external world change. We reasoned that if people believed they had changed over a period of time, they would be more inclined to attribute any notable differences between present and past to themselves, and hence be less inclined to attribute any such differences to a change in the world. Consistent with this idea, participants induced to believe that they had changed a lot since high school rated their hometowns, parents, high school friends, and high schools as having changed less than did participants induced to believe that they had changed very little since high school.

Study 5: School Daze

The results of Study 4 indicate exaggerated judgments of change in the world stem from a failure to appreciate the magnitude of change in the self. But even when people are aware of changes in themselves, they may sometimes fail to recognize the impact those changes may have on their perceptions of the external world. People's perceptions come to them as veridical representations of the world, and only upon reflection are they (sometimes) understood as constructions influenced by their own points-of-view and construals. As a result, even when people are aware of self-changes, it may take some effort for them to recognize how those changes have altered their perceptions of the external world.

Research on perception supports this contention (Epstein & Broota, 1986; Epstein & Lovitts, 1985; Rock & Nijhawan, 1989). In one study, for example, participants who were lying

upside down while they learned geometric patterns later took a recognition test while right-side up. Participants whose cognitive resources had been limited during the encoding phase by a distracting task were better at recognizing figures from the encoding set when those figures were presented upside down at test (i.e. when figures had the same orientation with respect to the participant as during encoding) than when the figures were presented right-side up (i.e. when figures had the opposite orientation with respect to the participant as during encoding). The authors interpreted this result as evidence that people require cognitive resources to account for the effect that their own body orientation has on their perception of stimulus patterns (Rock & Nijhawan, 1989). We similarly suggest that sufficient cognitive resources are required for people to use their knowledge of changes in the self to temper their judgments of change in the external world. To test this possibility, we provided participants with reminders of self-change and examined whether the impact of these reminders was moderated by the availability of cognitive resources.

Wilson and Ross (2000) found that temporal distance from a past event is one variable that makes changes in the self salient. All else being equal, people assume they've changed more since a given event the further in the past it is believed to have occurred. Wilson and Ross (2000) also found that perceived temporal distance from an event can be dissociated from actual temporal distance. Anyone who has remarked that his or her high school prom "feels like yesterday" but that last Tuesday "seems like ages ago" can attest to this fact. We capitalized on this dissociation in Study 5 to test our hypothesis that awareness of self-changes tends to diminish the tendency to perceive changes in the world—but only when individuals have sufficient resources to put this knowledge of self change to inferential use.

First year students typically appear and behave differently than upperclass students in numerous ways. Upperclassmen are often aware of the differences between themselves and the current freshmen at their university, but this difference could be produced by changes in the upperclassmen themselves since they were freshmen, changes in the students matriculating at their university, or a combination of the two. In this study, we manipulated whether upperclass Cornell students perceived their freshmen year to belong to the recent or distant past. We then asked them how much freshmen at Cornell had changed since they themselves were freshmen.

We predicted that the manipulation of perceived temporal distance from the freshman year would influence the salience of changes in the self since that time. Our own previous research using this manipulation demonstrates that participants rate themselves as having changed more since a particular point in the past if that point in time was manipulated to seem long ago rather than relatively recent⁵. The salience of self-change, we proposed, should in turn influence the tendency to attribute any apparent differences in the current class of freshmen students to change in themselves vs. change in the incoming students. We thus make the paradoxical (on the surface at least) prediction that participants who are made to feel that their own freshman year was long ago should perceive less change in the current freshmen class than participants made to feel that their own freshman year was quite recent. However, we hypothesized that this effect would occur only when participants had sufficient cognitive resources to take their knowledge of self-change into account.

Method

Participants. Participants were 60 Cornell University undergraduates (24 males, 36 females) enrolled in psychology or human development classes. Participants completed our questionnaire, with verbal instructions from the experimenter, at the end of an unrelated

experiment for which they received course credit for their participation. Twenty-nine of the participants were sophomores, 22 were juniors, and 9 were seniors.

Procedure. There were four versions of the questionnaire, which varied according to a 2 (*load, no load*) x 2 (*near, far*) experimental design. Versions were randomly assigned to participants and the experimenters were blind to the purpose of the study and to participants' conditions.

In the *load* conditions, the participants were asked to remember an 8-digit number as they read and completed each page of the questionnaire. They were informed that they would be required to report the 8-digit number at the end of the experiment, so they should do their best to keep it in memory while they completed the questionnaire. Once it was clear that this was understood, the experimenter read aloud the 8-digit number and instructed participants to begin. Participants in the *no load* condition simply completed the questionnaire without any mention of an 8-digit number.

After indicating their age, sex, and year in college, participants answered two questions designed to influence the perceived temporal distance between the present and participants' freshman year at Cornell. First, participants were asked to indicate the start of their own freshman year by making an "x" on a 14.2 cm timeline with one endpoint marked, "now." The other endpoint varied by condition (see Wilson & Ross, 2000). In the *near* condition the starting point was marked "birth;" in the *far* condition it was marked "16 years old." As intended, this endpoint manipulation induced participants in the *near* condition to mark the beginning of their freshman year as physically closer to "now" on the timeline ($M= 1.85$ cm, $SD= 0.71$) than did participants in the *far* condition ($M= 7.71$ cm, $SD= 1.90$).

To strengthen this manipulation, we used another of Wilson and Ross' techniques. We varied, in two instances, the wording used to refer to the participants' freshmen year. First, we described the ostensible purpose of the study as an examination of: "...how entering classes in the [distant past / recent past] at Cornell compare as freshmen." Second, we asked participants to indicate what they were like as freshmen, but we did so using different words in the two conditions (*far* condition italicized; *near* condition in brackets):

Please think *all the way back to when you were* [about when you were recently] a freshman at Cornell. On the following traits, please rate what you were like *back when you were a freshman* [when you were recently a freshman], in comparison with this year's freshmen. Compared with this year's freshmen, *back when I was* [*when I was recently*] a freshman I was....

Below this were six traits (academically motivated, socially skilled, immature, intelligent, independent/self-reliant, and narrow-minded), each accompanied by a scale that ranged from 0 (much less than most of this year's freshmen) to 10 (much more than most of this year's freshmen), with the midpoint, 5, marked, "the same as most of this year's freshmen."

After completing these ratings, participants completed the dependent measures. Participants first indicated how much freshmen at Cornell had changed since they were freshmen, using a scale ranging from 0 (not at all) to 6 (completely). The next question asked participants, "How similar the current freshmen are to your class as freshmen?" Participants responded by circling one of seven Venn diagrams that depicted increasing similarity between sets labeled, "my class then" and "current freshmen." The leftmost diagram depicted no overlap between the two sets and the rightmost diagram depicted complete overlap. Participants'

responses to this measure were converted to values on a 7-point scale, with the set depicting complete overlap scored “1” and the set depicting no overlap a “7”.

Results and Discussion

Participants’ ratings on the two dependent measures were highly correlated ($r = .61$) so we summed them to create a composite measure of perceived change. Figure 1 summarizes the means in each condition. A 2 x 2 between-participants ANOVA on these data yielded the predicted significant two-way interaction, $F(1, 56) = 5.81, p < 0.02$. When participants were unburdened by cognitive load, those in the *far* condition perceived freshmen to have changed less since they were freshmen ($M = 2.33, SD = 1.80$) than did participants in the *near* condition ($M = 3.73, SD = 1.67$), $t(28) = 2.21, p < .05$. When under cognitive load, however, there was no significant difference in the ratings made by participants in the *far* ($M = 4.20, SD = 1.52$) and *near* conditions ($M = 3.53, SD = 1.64$), $t(28) = 1.15, p > .2$.

These results conceptually replicate and extend those from Study 4. As in Study 4, participants detected less change in the external world when their own changes were made salient to them. This effect was only apparent, however, when participants had sufficient cognitive resources to process the relevant information about change in themselves. When their cognitive resources were depleted by a concurrent task, participants did not use their knowledge of self-change to temper their judgments of how much incoming freshman had changed. Thus, when cognitive resources are taxed, people seem to take their perceptions for granted and assume that a detected change implies a real change in the properties of the objects under consideration – even when changes in the self have been made salient. When cognitive resources are available, however, people are able to make use of information about self-change to explain the change in their perceptions.

Study 6: Weight Watchers

We sought to extend the previous findings by exploring whether similar effects might be observed in a domain with great motivational significance to the individual. It is common for people to strive to change aspects of themselves in various ways (Klar, Nadler, & Malloy, 1992). Dieting to lose weight is one particularly prominent example of self-motivated change. Such dieters may experience the world as having more temptations than it did before they began to diet. Such a belief could impair one's ability to summon the will necessary to maintain one's diet. Research indicates that, controlling for body weight, dieters are more responsive to external food cues than are non-dieters (Baumesiter, Heatherton, & Tice, 1994). For instance, dieters salivate more in response to food cues (Herman, Polivy, Klanjner, & Esses, 1981). It is possible that if dieters fail to take into account these changes in their attentiveness to food stimuli, they might judge that food stimuli had actually become more prevalent and attractive.

This could lead them to despair over the prospect of overcoming such increasingly present temptation, and, in fact, to give up trying. We hypothesized that participants whose diets had become more restrictive over the past ten years would judge that advertisements for unhealthy foods had become more prevalent and more effective over that same period – unless they were reminded of the change in their own diets before making this judgment. When changes in their own eating habits were made salient, we expected participants to take this information about self-change into account and render less extreme judgments of change in food advertisements.

In addition to investigating another domain in which people may confuse self- and world-change, Study 6 was also meant to provide further evidence for the proposed mechanism underlying this effect. Studies 4 and 5 suggest that self-change should inflate judgments of

external change when people are unaware of self-change or lack the cognitive resources to use information about self-change to correct their judgments of external change. This implies that when changes in the self are not salient assessments of self-change should be correlated with assessments of change in the world. When change in the self is salient, however, there should be no such correlation.

Method

Participants. Thirty-two female undergraduates participated for extra-credit in Cornell psychology and human development courses.

Procedure. Participants were randomly assigned to one of two conditions. In one, participants made judgments about the magnitude of change in food marketing during the past 10 years and then reported changes in their own eating habits over the same time period. The materials in the other condition were identical except that participants answered the questions about change in their own eating habits before they were asked to make judgments about change in food marketing.

Three questions asked about change in participants' eating habits: 1) "Do you limit your eating more, less, or about the same amount today as you did 10 years ago?"; 2) "Do you diet more, less, or about the same amount today as you did 10 years ago?"; 3) "Do you try to avoid eating unhealthy foods more, less, or about the same amount today as you did 10 years ago?" For all three questions, participants indicated their response on 5-point rating scales ranging from -2 (much less today than 10 years ago) to +2 (much more today than 10 years ago).

Participants made two judgments of change in food marketing. First, they rated change in the effectiveness of the marketing and packaging of food products using a 5-point scale ranging from -2 ("the packaging and marketing of foods are much less effective today than 10 years ago") to +2 ("the packaging and marketing of foods are much more effective today than 10 years ago").

ago”) to +2 (“the packaging and marketing of foods are much more effective today than 10 years ago”). Second, they rated change in the quantity of food advertisements on television using 5-point scales ranging from -2 (“there are many fewer ads for unhealthy foods today than 10 years ago”) to +2 (“there are many more ads for unhealthy foods today than 10 years ago”).

Results and Discussion

The three measures of dietary change were highly correlated ($r = .87$) so we summed them to create a composite measure of self-reported diet change. Ratings of change in the effectiveness of food marketing techniques and the prevalence of unhealthy food advertisements were not significantly correlated ($r = .29$), so we analyzed them separately.

As predicted, participants who rated change in the prevalence of food advertisements without first reporting changes in their own diets (and who thus were unlikely to think about changes in their own diets at the time they rated the amount of change in the world) judged that the prevalence of food advertisements had changed more over the past 10 years ($M = .56$, $SD = .89$) than did participants who rated the change in prevalence of food advertisements after reporting change in their own diets ($M = -0.33$, $SD = 1.04$), $t(29) = 2.57$, $p < .01$.⁶ Also as predicted, participants who rated change in the effectiveness of food marketing without first reporting changes in their own diets judged that the effectiveness of food marketing had changed more over the past 10 years ($M = 1.12$, $SD = .81$), than did participants who rated the change in effectiveness of food marketing after reporting changes in their own diets ($M = .73$, $SD = .70$), although this difference was not statistically significant, $t(29) = 1.44$, $p > .1$. Importantly, the two conditions did not differ in self-reported diet change, $t < 1$.

As hypothesized, self-reported diet change was positively correlated with judged change in the prevalence of food ads when participants made the latter judgments *before* reporting their

diet changes ($r=.53, p<.05$) but not when participants made those judgments *after* reporting their diet changes ($r = -.18, p >.5$). The difference between the two correlations is statistically significant; $z = 2.08, p < .05$. A similar, but much weaker, pattern emerged with respect to participants' ratings of change in food marketing effectiveness. Self-reported diet change was positively correlated with judged change in food marketing effectiveness when participants made the latter judgments before reporting their diet changes ($r =.21, p >.1$) but not when participants made those judgments after reporting their diet changes ($r = -.03, p >.5$). However, the difference between these correlations is not statistically significant; $z = .62, p >.1$. Although the results involving the prevalence measure are more definitive, the overall pattern of results is consistent with our hypothesis that participants correct for the effects of changes in themselves on their perceptions of change in the world, but only when information about self-change is salient at the time of judgment.

General Discussion

Data from archival and original surveys, along with results from four laboratory experiments support our hypothesis that unrecognized changes in the self lead to exaggerated assessments of change in the social world. Study 1 showed that significant changes in people's lives (change in financial status, becoming a parent) were associated with the belief that there had been significant changes in the world (altered freedom, increased danger). Study 2 found that that the transition to parenthood is tightly connected to the "realization" that the world is becoming a more dangerous place. We argued that parenthood increases a person's alertness to threats and dangers in the external world and, when this personal change goes unrecognized, it leads to a sense that the world itself is becoming a more dangerous place. In Study 3, we demonstrated that an experimentally induced change in participants' knowledge led to a

corresponding change in their beliefs about the external stimuli with which they were presented. In Studies 4 and 6 we demonstrated that increasing a person's awareness of personal changes over a given period of time tends to reduce the tendency to assume that the world has changed during that same time period. But the results of Study 5 indicate that information about self-change only tempers judgments of change in the external world when a person has sufficient cognitive resources to take into account the ways that self-change may have affected his or her perceptions.

Based on the research presented here, it appears that there are at least two routes by which self-change leads to exaggerated impressions of change in the external world. Because self-change is often subtle, gradual, and non-salient, one is often unaware of one's own changes and so differences in how the world appears are simply attributed to how the world is. In our studies, without being prompted about how much they had changed, participants were rather inclined to see the world as having changed. But even when prompted about their own changes, participants saw the world as having changed as well. The various prompts about self-change we used in Studies 4-6 reduced participants' judgments of how much the world had changed by an average of 31%. They did not reduce assessments of world change to zero. When individuals are aware that they themselves have changed during the critical interval, they consciously confront a difficult attributional dilemma. How much of the difference in how things appear is due to change in oneself and how much to change in the world? In confronting this dilemma, people typically rely on abstract theories about which sort of change is more plausible. Many times, as we suggested earlier, such theories make quick work of the dilemma as only one sort of change is possible. When a film one saw as a child seems different when watching it with one's own children, it is apparent that the film itself hasn't changed; the self has. But in the cases

examined in the present research, for example, the possibility of actual change in the world is not far-fetched. Freedom waxes and wanes, crime waves rise and fall, advertising can—has!—become louder and more frequent, and an author's style and thematic focus can evolve.

Previous research on the influence of changes in the self on judgment

Previous research in a number of contexts is consistent with the thesis that unrecognized changes in the self can influence people's judgments of the external world. Most prominent, perhaps, is research on adaptation (Helson, 1964), which demonstrates that organismic changes that affect one's adaptation-level result in altered perceptions and reactions to stimuli in the external world, even if those stimuli remain constant in character and magnitude. In a particularly dramatic example, Brickman, Coates, and Janoff-Bullman (1978) demonstrated that lottery winners, as a result of adaptation to their new standard of living, found mundane daily pleasures less enjoyable than did matched controls whose adaptation-levels had not changed. Although this research did not investigate whether changes in adaptation-levels caused people to judge that stimuli in the world had changed, these findings nevertheless support the idea that changes in the self can affect judgments of stimuli in the external world.

In a study by Kelley and Jacoby (1996), participants who read words that later appeared as anagrams thought that others would find those anagrams easier to solve than did control participants not exposed to those words. However, when participants were reminded of their recent exposure to the solutions and were informed that it would make the anagrams seem easier, participants' judgments about how easy others would find the anagrams were comparable to controls'. Jacoby and Kelley did not ask their participants to make change judgments, but their results are consistent with those from our Studies 4 and 6. In all cases, making participants aware

of how changes in their own unique perspectives would affect their perceptions tempered their judgments about the objective state of the world.

Zimbardo, Andersen, & Kablat (1981) gave participants a hypnotic suggestion causing their hearing to be impaired. Half were aware that they had been hypnotized to have a hearing impairment, but the other half were hypnotically induced to have source amnesia regarding the hypnotic procedure. All participants then interacted with a pair of confederates in a joint activity and afterwards completed a paranoia scale. The participants who were hypnotized to be unaware of their hearing impairment exhibited more paranoid responses than did those who had impaired hearing but were aware of the hypnotic suggestion. The researchers suggest that hearing loss, when it is unrecognized, can cause people to become paranoid about their world because they believe that others are covertly whispering to deliberately conceal communications from them (Zimbardo, 1999).

Why are social changes so often perceived to be negative?

Our analysis can account for erroneous judgments of change for the better or worse. On the positive side, we found in Study 1 that individuals whose finances improved during a given time period were more inclined than respondents whose finances had not changed for the better to believe that "freedom in America" had increased during the period in question. More generally, we would predict that whenever a person undergoes a change that casts some aspect of the world in a more positive light, he or she may develop an illusory belief that this aspect of the world is improving. There is, for example, a well-documented tendency for mere exposure to increase liking for a stimulus (Bornstein, 1989; Frederick, 2002; Zajonc, 1968) as well as evidence suggesting that people sometimes fail to realize that mere exposure influences their

hedonic experience in this way (Kahneman and Snell, 1992). Thus, increased contact with a given acquaintance might cause one to mistakenly believe that the acquaintance's personality has improved with time. It may also be the case that an improvement in one's mood can lead to the mistaken impression that elements of one's environment have become more congenial. In his bestseller *Listening to Prozac* (1993), for example, Peter Kramer describes a woman who, after receiving medication, thought that her husband had undergone something of a transformation. "Gail now found her husband more affectionate and less hostile. I understood this change in perception as stemming from Gail's greater tolerance for teasing – that is, a diminished sense of vulnerability (p. 94)." A chemically-induced improvement in mood, in this case, seems to have led to the conviction that a critical element of the woman's environment had changed.

These examples notwithstanding, one of the most striking features of people's judgments of change in the social world is that the changes are so often judged to be negative. The survey data reviewed in the introduction suggest that the majority of people believe that crime is increasing, morality is declining, children are becoming more spoiled, and the lot of the average person is getting worse. And when one hears people talking about "the good old days", longing for "the way things used to be", or lamenting that "they don't make things like they used to", one cannot escape the impression that social conditions are perceived to be in decline. Any theory that attempts to explain people's beliefs about societal change must account for this prevailing negativity.

The pervasive sense of societal decline can be understood from the perspective developed in this paper if we assume that many of the personal changes that people experience as they mature cause their experiences of the external world to become increasingly negative – an increasing negativity that they attribute to changes in the world rather than to changes in

themselves. One change, for example, that everyone experiences is the process of physical aging. For everyone who lives long enough, youthful vitality gives way to the ravages of age. Herman (1997) writes,

Why is this sense of [social] decline so common to all cultures? It may simply represent the human experience of bodily changes from childhood to maturity and the inevitable decay of physical and mental capacity in old age. The collective memory of the past tends to be a world endowed with powers that now seem lost. (p.14)

Perhaps the decline in physical and mental health that occurs as people age causes them to experience the world as a more frustrating and less vital place than it was in their younger days. If they fail to recognize—or, more likely, fully appreciate—that this change in their experience of the world is caused by the changes in themselves, they may conclude that the world itself is changing for the worse.

Another way that many people change as they age is that they gradually acquire a more cynical view of the social world. During childhood, society tends to shield us from the darker truths about human nature and social conditions. Postman (1994) writes:

[O]ne of the main differences between an adult and a child is that the adult knows about certain facets of life – its mysteries, its contradictions, its violence, its tragedies – that are not considered suitable for children to know...In the modern world as children move toward adulthood we reveal these secrets to them.... (p. 15).

As we grow older, we see beyond our childish illusions that the world is just, that bad things only happen to bad people, that we can trust heroes and political leaders, and that good triumphs over evil. Once these myths are shattered, the change is often irreversible and we can't look at the world in quite the same way. Innocence is readily lost but very rarely regained. The

disillusionment that comes with maturity thus equips us with a set of more cynical lenses through which we view the world. If people do not recognize that their most basic assumptions about the world have changed, they may come to believe that the world itself has become a darker, less trustworthy place than it was during their childhoods.

Yet another important way that many people change during their lifespans is by becoming parents. As we pointed out earlier, parenthood causes one's perception of the world to become more negative because becoming a parent heightens one's sensitivity to various hazards. The data from Studies 1 and 2 are consistent with our prediction that, as a result of this increased sensitivity to risk, becoming a parent causes people to believe that the world is becoming a more dangerous and violent place. Thus, becoming a parent may be one important life change that contributes to the widespread belief that social conditions are in decline.

Simple observation reveals an all too familiar case in which unrecognized changes in the self lead to judgments of decline in the world. For the past several generations, the music blaring from teenage children's rooms has prompted parents to lament the deterioration that has occurred in popular music since the days of their own youth. Indeed, research has documented that people consider the songs and films from their own young adult years to be superior to songs and films from other eras (Holbrook, 1993; Holbrook & Schindler, 1989). One explanation of this phenomenon involves the "coming of age" process (Rubin, Rahhal, & Poon, 1998). Young adulthood is when people are typically introduced to these genres. The films and music of the time define the genre for them—subsequent deviations do not fit their template. In this case, it is changes in one's own familiarity with the styles of music and films from different eras that determine their evaluation as much as the objective quality of the music and films themselves.

And a lack of awareness of such changes could explain why parents and teenagers fight over which era's music is superior.

The question of why people's assessments of societal change are biased toward perceived decline has been addressed previously. Schwarz, Wanke, and Bless (1994) considered how several well-known judgmental biases might contribute to this phenomenon. They point out that comparisons with the past are often prompted when there is a problem in the present, and that in such instances people will tend to compare the present to the past rather than vice-versa. Building on previous research, Schwarz et al. reasoned that the problems of the present frame the features used in the comparison. As a result, problems in the past in other domains or along other dimensions go unnoticed. And because the present problem that prompted the comparison was often not present in the past, the present comes off badly in the comparison. According to this reasoning, people should be less likely to perceive decline if they compared the past to the present, but Schwarz et al. propose that this is not the natural direction of comparison. Schwarz et al. also apply prospect theory to explain why people might be biased to perceive societal decline from past to present. Losses loom larger than gains, and so even if there are societal declines and improvements of equal size, the declines will seem more pronounced, leading to a perception of net deterioration. In a similar vein, Schwarz et al. propose that due to the endowment effect, people see losses of what they had as more painful than they see gains of equal size as pleasurable.

Our model does not contradict Schwarz et al.'s; it complements it. The judgmental biases they discuss explain why people might be biased to perceive the present as worse than the past. However, these biases do not make any predictions about the perceived timing of the change. Because we link the individual's own experience over time with their perceptions of the past

over time, our theory suggests exactly when people should perceive negative changes to have taken place. In this way our theory adds the ability to make more detailed predictions about the perceived time course of societal decline.

Conclusion

When I was a boy of fourteen, my father was so ignorant I could hardly stand to have the old man around. But when I got to be twenty-one, I was astonished at how much the old man had learned in seven years.

Mark Twain, *Reader's Digest*, Sept. 1937.

Twain pokes fun at the very process of egocentric assessments of change that we proposed and documented in this paper. Results from survey analyses and experimental data suggest that, like the tongue-in-cheek Twain, people often exaggerate the magnitude of external change because they are unaware of, or fail to take into account, the ways in which their own changes have altered their perceptions of the external world. Exaggerated assessments of change in the world thus appear to be the byproduct of a dynamic self with naïve realist tendencies.

References

- Asch, S.E. (1952). *Social psychology*. Englewood Cliffs, N.J.: Prentice-Hall.
- Austin, E. (1998, April 6). A small plea to delete a ubiquitous expletive. *U.S. News & World Report*, 124, 58-59.
- Baumeister, R.F.; Heatherton, T.F.; & Tice, D.M. (1994). *Losing control: How and why people fail at self-regulation*. San Diego, Calif.: Academic Press.
- Bem, D.J., & McConnell, H.K. (1970). Testing the self-perception explanation of dissonance phenomena: On the salience of pre-manipulated attitudes. *Journal of Personality & Social Psychology*, 14, 23-31.
- Best, J. (1990). *Threatened children: Rhetoric and concern about child victims*. Chicago, Il.: University of Chicago Press.
- Bork, R. (1996). *Slouching towards Gomorrah: Modern liberalism and American decline*. New York, NY: Regan Books/Harper Collins.
- Bornstein, R.F. (1989). Exposure and affect: Overview and meta-analysis of research, 1968-1987. *Psychological Bulletin*, 106, 265-289.
- Brickman, P, Coates, D., & Janoff-Bulman, R. (1978). Lottery winners and accident victims: Is happiness relative? *Journal of Personality & Social Psychology*, 36, 917-927.
- Burns, N., Kinder, D.R., Rosenstone, S.J., Sapiro, V. & the National Election Studies. (2000). NATIONAL ELECTION STUDIES, 2000: PRE-/POST- ELECTION STUDY [dataset]. Ann Arbor, MI: University of Michigan, Center for Political Studies [producer and distributor], 2001. Available at: <http://sda.berkeley.edu:7502/D3/NES2000/Doc/ns00.htm> or <http://csa.berkeley.edu:7502/D3/NES2000/Doc/ns00.htm>

- Conway, M. & Ross, M. (1984). Getting what you want by revising what you had. *Journal of Personality & Social Psychology*, 47, 738-748.
- Davis, J.A., Smith, T.W., Marsden, P.V. (2000). *The General Social Survey, 2000: Codebook and Datafile, 1972-2000* [Computer File]. Chicago, IL.: National Opinion Research Center and University of Chicago. Available at <http://sda.berkeley.edu:7502/cgi-bin12/hsda?harcsgss00> or <http://csa.berkeley.edu:7502/cgi-bin12/hsda?harcsgss00>
- Dillin, J. (1998, December 16). Is morality in decline? *Christian Science Monitor* [On-line]. Available: <http://www.csmonitor.com/durable/1998/12/16/p11s1.htm>.
- Epstein, W., & Broota, K.D. (1986). Automatic and attentional components in perception of size-at-a-distance. *Perception & Psychophysics*, 40, 256 – 262.
- Epstein, W., & Lovitts, B.E. (1985). Automatic and attentional components in perception of shape-at-a-slant. *Journal of Experimental Psychology: Human Perception and Performance*, 11, 355 – 366.
- Feeney, J.A., Hohaus, L., Noller, P., & Alexander, R. (2001). *Becoming parents: Exploring the bonds between mothers, fathers, and their infants*. New York, NY: Cambridge University Press.
- Frederick, S. (2002). Automated choice heuristics. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 548-558). New York: Cambridge University Press.
- Gibbs, N. (2001, August 6). Who's in charge here? *Newsweek*, 158, 40-49.
- Gibbs, R.W. (1999). *Intentions in the experience of meaning*. New York, NY: Cambridge University Press.
- Gilbert, D.T., & Gill, M.J. (2000). The momentary realist. *Psychological Science*, 11, 394-398.

Gilbert, D.T., Brown, R.P., Pinel, E.C., & Wilson, T.D. (2000). The illusion of external agency.

Journal of Personality and Social Psychology, 79, 690 – 700.

Goethals, G.R., & Reckman, R.F. (1973). The perception of consistency in attitudes. *Journal of*

Experimental Social Psychology, 9, 491-501.

Greenwald, A. G. (1980). The totalitarian ego: Fabrication and revision of personal history.

American Psychologist, 35, 603-618.

Griffin, D.W., & Ross, L. (1991). Subjective construal, social inference, and human

misunderstanding. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*,

(Vol. 24., pp. 319-359). San Diego, CA: Academic Press.

Helson. H. (1964). *Adaptation-level theory: An experimental and systematic approach to*

behavior. New York, NY: Harper & Row.

Herman, A. (1997). *The idea of decline in Western history*. New York, NY: Free Press.

Herman, C.P.; Polivy, J.; Klanjer, F.; & Esses, V. (1981). Salivation in dieters and non-dieters.

Appetite, 2, 356-361.

Holbrook, M. B. (1993). Nostalgia and consumption preferences: Some emerging patterns of

consumer tastes. *Journal of Consumer Research*, 20, 245 - 256.

Holbrook, M.B., & Schindler, R.M. (1989). Some exploratory findings on the development of

musical tastes. *Journal of Consumer Research*, 16, 119 – 124.

Kahneman, D., & Snell, J. (1992). Predicting a changing taste: Do people know what they will

like? *Journal of Behavioral Decision Making*, 5, 187-200.

Kelley, C.M., & Jacoby, L.L. (1996). Adult egocentrism: Subjective experience versus analytic

bases for judgment. *Journal of Memory & Language*, 35, 157-175.

- Klar, Y., Nadler, A., & Malloy, T.E. (1992). Opting to change: Students' informal self-change endeavors. In, Y. Klar, J.D. Fisher, J.M. Chinsky, & A. Nadler (Eds.), *Self-change: Social psychological and clinical perspectives*, (pp. 63-83). New York: Springer-Verlag.
- Kramer, P. (1993). *Listening to Prozac: A psychiatrist explores antidepressant drugs and the remaking of the self*. New York: Penguin Books.
- LaFree, G. (1999). Declining violent crime rates in the 1990's: Predicting crime booms and crime busts. *Annual Review of Sociology*, 25, 145-168.
- Levine, L.J. (1997). Reconstructing memory for emotions. *Journal of Experimental Psychology: General*, 126, 165-177.
- McFarland, C. & Ross, M. (1987). The relation between current impressions and memories of self and dating partners. *Personality & Social Psychology Bulletin*, 13, 228-238.
- McFarland, C, Ross, M., DeCourville, N. (1989). Women's theories of menstruation and biases in recall of menstrual symptoms. *Journal of Personality & Social Psychology*, 57, 522-531.
- McFarland, C., Ross, M., & Giltrow, M. (1992). Biased recollections in older adults: The role of implicit theories of aging. *Journal of Personality & Social Psychology*, 62, 837-850.
- Neisser, U. (1967). *Cognitive psychology*. Englewood Cliffs, NJ: Prentice-Hall.
- Percy, W. (1987). *The thanatos syndrome*. New York, NY: Farrar/Straus/Giroux.
- Postman, N. (1994). *The disappearance of childhood*. New York, NY: Vintage Books.
- Robinson, R.J., Keltner, D., Ward, A., & Ross, L. (1995). Actual versus assumed differences in construal: "Naïve realism" in intergroup perception and conflict. *Journal of Personality & Social Psychology*, 68, 404-417.

- Rock, I., & Nijhawan, R. (1989). Regression to egocentrically determined description of form under conditions of inattention. *Journal of Experimental Psychology: Human Perception and Performance*, *15*, 259 – 272.
- Ross, L., & Ward, A. (1996). Naïve realism in everyday life: Implications for social conflict and misunderstanding. In E.S. Reed, E. Turiel, & Brown T. (Eds.) *Values and knowledge: The Jean Piaget symposium series*, (pp. 103-135). Hillsdale, NJ: Lawrence Erlbaum.
- Ross, M. (1989). The relation of implicit theories to the construction of personal histories. *Psychological Review*, *96*, 341-357.
- Rubin, D.C., Rahhal, T.A., & Poon, L.W. (1998). Things learned in early adulthood are remembered best. *Memory & Cognition*, *26*, 3 – 19.
- Ruddick, S. (1995). *Maternal thinking: Toward a politics of peace* (2nd edition). Boston, Mass: Beacon Press.
- Sawyer, D. (1998, May 6). Ellen uncensored: Differing views of why her show was cancelled. *Primetime live*. New York, NY: ABC News.
- Schwartz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., & Simons, A. (1991). Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality & Social Psychology*, *61*, 195-202.
- Silka, L. (1981). Effects of limited recall of variability on intuitive judgments of change. *Journal of Personality & Social Psychology*, *40*, 1010-1016.
- Silka, L. (1983). "You just can't count on things anymore": Perceptions of increased variability in the present. *Personality and Social Psychology Bulletin*, *9*, 621-628.
- Silka, L., & Albright, L. (1983). Intuitive judgments of rate change: The case of teenage pregnancies. *Basic and Applied Social Psychology*, *4*, 337-352.

- Sniderman, P.M., Brady, H., et.al. (1999). Multi-investigator study, Cumulative datafile and codebook 1998-1999[Computer File]. Berkeley, Calif: Survey Research Center,University of California, Berkeley [distributor],1999. Available at:<http://sda.berkeley.edu:7502/D3/Multi2/Doc/mi2i01.htm> or <http://csa.berkeley.edu:7502/D3/Multi2/Doc/mi2i01.htm>
- Sprecher, S. (1999). "I love you more today than yesterday": Romantic partners perceptions of change in love and related affect over time. *Journal of Personality & Social Psychology*, 76, 46-53.
- Wilson, T.D., Centerbar, D.B., & Brekke, N. (2002). Mental contamination and the debiasing problem. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 185-200). New York: Cambridge University Press.
- Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology*, 9 (No. 2, Pt. 2).
- Zimbardo, P. G. (1999). Discontinuity theory: Cognitive and social searches for rationality and normality - may lead to madness. In, M. P. Zanna (Ed.), *Advances in Experimental Social Psychology*, (Vol. 31, pp. 345-486). San Diego, CA: Academic Press.
- Zimbardo, P.G., Andersen, S.M., & Kabat, L.G. (1981). Induced hearing deficit generates experimental paranoia. *Science*, 212, 1529-1531.

Author Note

Richard P. Eibach, Department of Psychology, Cornell University; Lisa K. Libby, Department of Psychology, Cornell University; Thomas D. Gilovich, Department of Psychology, Cornell University.

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Correspondence concerning this article should be addressed to Richard P. Eibach, at the Department of Psychology, Uris Hall, Cornell University, Ithaca, New York, 14853. Electronic mail may be sent via the internet to RPE1@cornell.edu, LKL3@cornell.edu, or TDG1@cornell.edu.

Footnotes

¹All results in this mediational analysis remained the same when respondents' age, sex and race were included as covariates.

²The difference between these two groups remained significant when we performed an ANCOVA which included survey type and respondents' race, sex, and age as covariates; $F(1, 1445) = 4.86, p < .05$.

³The validity of this analysis can be questioned because it treats the data from all participants as independent even though many of them shared the same time period of transition to parenthood. To account for this, we ran an alternative analysis that used the six periods of transition to parenthood as the unit of analysis, comparing the mean ratings of all participants who experienced the transition to parenthood during that interval with the mean rating of all participants who did not. This result was statistically significant, $t(5) = 2.81, p < .05$, indicating that the results reported above are not an artifact of the non-independence of data in that analysis. In both of these analyses the comparison group excluded the non-parents. However, the results of both analyses are the same when the non-parents are included.

⁴To demonstrate that this perceived change during the transition to parenthood persists, we compared the difference between ratings of the present and past for the two time periods flanking the transition to parenthood with the average difference between all subsequent periods. The difference during the critical transition to parenthood was significantly greater than the mean of the latter difference, paired $t(29) = 3.18, p < .01$.

⁵Data available from the first author upon request.

⁶In the condition in which participants first reported dietary changes, one participant was a significant outlier. This participant has been excluded from this and all subsequent analyses. However, the pattern of results is the same if this outlier is included.

Table 1

Percentage of respondents stating that freedom has decreased, remained the same, or increased in relation to change in one's own financial situation

Change in freedom in America			
Financial change	Less freedom	No change	More freedom
Financial decline	23	37	39
No change	19	43	38
Financial gain	17	36	46

Table 2

Mean change in relative danger ratings (present compared to the past) for each temporal interval of participants who experienced a transition to parenthood during each interval and the comparison group who did not

<u>Transition interval</u>	<u>N</u>	<u>Transition group mean</u>	<u>Comparison mean</u>	<u>Difference</u>
0 to 5	1	0.00 (----)	0.13 (1.89)	-0.13
5 to 10	4	1.25 (0.50)	0.56 (0.97)	0.69
10 to 15	4	2.00 (0.82)	0.67 (1.24)	1.33
15 to 20	5	1.60 (1.34)	0.81 (1.33)	0.79
20 to 25	13	2.15 (2.08)	0.78 (1.35)	1.37
25 to 30	4	0.25 (0.50)	0.11 (0.32)	0.14

Notes. Numbers in the transition and comparison columns reflect the mean change in perceived contrast between the present and past for each interval. Positive numbers indicate increasing danger. Where the difference between the transition and comparison means is positive a greater increase in danger was perceived by the transition group.

Numbers in parentheses are standard deviations.

Figure caption

Figure 1. Mean change in freshmen ratings given by participants under cognitive load or no load when their own freshman year was made to seem temporally near or far.

